

COMPUTERWORLD

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SEPTEMBER 22, 1986

VOL. 12, NO. 38

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Mac add-ons unveiled as Jobs departs

By Steven Malhotra

CUPERTINO, Calif. — Anticipated features surrounding Apple Computer, Inc.'s introduction of its long-awaited 30M-byte hard disk and additional software and peripherals for the Macintosh computer was unveiled last week when Chairman Steven Jobs angrily resigned from the firm he cofounded and helped to lead the microcomputer revolution.

Jobs resigned last week amid charges that he raised the company of five key employees with whom he planned to start an educational software firm. When it was reported that Apple's board of directors was considering taking action against Chairman Jobs, Jobs insisted the board accept his resignation.

The resignation letter, which Jobs made immediately available to several newspapers, said the board of directors had taken a "hostile posture" toward him as a result of the new venture. In addition, he said, "The company's recent reorganization left me with no work to do and no access even to regular management reports."

News of the Jobs departure overshadowed last week's introduction of several key new Apple products. Among them was a 30M-byte, 51/2-in. Winchester hard disk drive for which Macintosh business users have long been clamoring and which is seen as one of the peripherals the Macintosh needs to be considered a serious business tool.

"It's unfortunate the announcement has become as clouded with this new open," said Jan Lewis, an analyst with the Palo Alto Research Group in California. Apple's introduction of the hard disk drive was long overdue, Lewis said. "Apple had to come out with it. It couldn't go after the business market.

Continued on page 6

Washington eases AT&T computer sales strictures

Permission conditional on revenues disclosure

By Bryan Williams

WASHINGTON, D.C. — In the most significant deregulatory move since the divestiture of AT&T, the Federal Communications Commission last week conditionally approved AT&T's request to market its telephone and computer equipment lines together with its regulation of transmission services.

The FCC said it will drop the present requirement that AT&T sell telephone and computer equipment separately through its Information Systems subsidiary, still in effect, however, is a requirement to maintain a separate sales operation for enhanced telecommunications services like electronic mail.

As a result, AT&T will no longer be

forced to maintain duplicate marketing forces in its Information Systems and Communications subdivisions, allowing the company to integrate its bids for large-volume corporate customers. Since deregulation, these customers have often complained about AT&T's lack of coordination when dealing with its clients.

AT&T Executive Vice-President Charles Marshall alluded to these complaints in reacting to the FCC decision. "For our customers, it will mean better service," Marshall said in a prepared statement. "Various parts of our business will be in a position to work together to offer customers a fully integrated approach to their equipment and network service needs and, where desirable, one point of contact with the company."

Marshall said 10 corporate or government accounts will be selected for service by an integrated marketing team, which

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TOP OF THE NEWS

Score another one for Lotus' campaign against unauthorized reproduction of micro software. The latest company to come clean is Computerknowledge, a Dallas-based software training organization, which late last week disclosed that it had uncovered and halted widespread illegal copying of Lotus 1-2-3 among its employees. Computerknowledge had an existing written policy prohibiting unauthorized software duplication by employees and is a member of the Association of Data Processing Service Organizations, the professional organiza-

tion that has taken the lead in combatting illegal software reproduction.

Cray Research, manufacturer of some of the largest computers known to man, just released an upgrade of its X-MP line offering more memory than ever before. But users are still clamoring for storage space. "We have very large memory requirements and could use any memory Cray makes available," said Steven Walworth, planning analyst at the National Aeronautics and Space Administration's Ames Research Center

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Productivity key concern at Software/Expo

By John Dunning
and John Galt

Despite all that is new in the computer industry, users at last week's Software/Expo in Dallas seemed most concerned with issues and technologies they have wrestled with for some time.

Underlining them all, however, was a concern regarding productivity in U.S. business and the computer software industry's failure to cope effectively with this matter.

Regarding other concerns, users appeared to be still wrestling with some mundane, unglamorous issues such as controlling the massive influx of personal computers, paring the applications backlog and implementing core products like data base management systems and micro-mainframe links.

The first to address the productivity issue was keynote speaker Tom Nies, chief

executive officer of Cincom Systems, Inc., the sole vendor to use the show as a springboard for a major product introduction (see story below). Nies declared that the current computer industry recession was the result of a declining rate of productivity improvement across all industries. The Cincom Systems executive placed blame for faltering productivity

squarely on the shoulders of software vendors — IBM and the independents.

"The computer industry recession is primarily caused by the software vendors' old-fashioned approach to software," Nies said. "That approach makes it impossible for customers to consume new computers. It inhibits the forward movement of the computer industry."

Crediting hardware vendors with great advances, Nies said those gains have largely been negated by the software industry's evolutionary, almost small-paced advances. "The idea of software generations is a hoax," he said. "There have been no revolutionary periods of change. There have been no great leaps and bounds."

With the failure of software to use the full potential of hardware, "we, as DP professionals, will not be able to satisfy the hoped-for revolution in DP. We won't be able to support, for example, distributed processing, real end-user computing

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Cincom DBMS out

By John Galt

DALLAS — Serving notice to rivals that it intends to win back its "rightful place" in the data base management system market, Cincom Systems, Inc. last week introduced a relational DBMS

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NEWSPAPER

NEWS

CDC losses kill bond offer

Divesting assets seen likely to stem losses, boost rating

By Clinton Wilder

MINNEAPOLIS — Control Data Corp. is facing steep losses and a potentially severe fiscal crisis in the wake of last week's 11-hour cancellation of a \$300 million public offering of bonds and preferred stock.

That is the opinion of analysts and company observers who have watched the U.S.'s fourth largest computer company founder in a sea of unsuccessful diversifications and devastating losses in the computer peripherals business. Most analysts said they believe CDC's No. 1 priority must be the continued sale of its corporate assets to raise cash for the preservation of credit arrangements with its banks.

The company had intended to use the proceeds of the offering to pay off debt issues. In recent weeks, the company announced it has fallen into technical default on covenants contained in those issues.

CDC's Commercial Credit Co. subsidiary, whose current profitability has offset some of the firm's losses in the computer business, appears to be the most likely candidate for divestiture, either as a whole or in parts. The proposed sale of the business to Security Pacific Co. was canceled in June, but Commercial Credit has restructured since then and is projected to more than triple its \$26.2 million first-half profit for the full year.

By contrast, CDC's information services and products business unit, which comprises mainframes, supercomputers, peripherals and data processing and other automated services, lost \$32.7 million in the first six months of 1985. Some estimates project the full-year loss for the computer unit at as high as \$100 million.

"By selling off assets, it buys [the company] time to get operations under control. There are some very attractive assets within Commercial Credit," said Michael Goren of E. F. Hutton & Co. CDC's current volatile situation was sparked

Sept. 17, when underwriter Goldman, Sachs & Co. announced it would not authorize CDC's sale of \$100 million in share of depository preferred stock and \$200 million in subordinated debentures or bonds.

In addition to forcing the company to seek alternative short-term financing to replace the offering, the news rocked Wall Street's confidence in CDC's financial future. Within hours, Standard & Poor's Corp. lowered its credit ratings on the senior debt, preferred stock and commercial paper of CDC and Commercial Credit.

If Goldman, Sachs, with its reputation for integrity and thoroughness, rejected the offering, there's a lot more to CDC's situation than has been reported before," said William Shaffer, president of the Minneapolis consulting firm of Shaffer & Associates, Inc. and a veteran CDC observer. "When you add up all the indicators, it's a very serious situation."

Shaffer said customer confidence may be shaken in the company. "The scientific user community is very dependent on support. It's hard to sell in that environment without confidence in that support."

E. F. Hutton's Goren predicted CDC will pay particular attention to support to prevent further erosion of its customer base. He said the company's biggest financial drains are its peripherals and DP services businesses.

Analyst Jonathan Fram of Paine Webber, Inc. compared CDC's experience in peripherals to battered semiconductor vendors in the dynamic random-access memory chip market. Excess capacity and a wave of Japanese imports have turned the saturated peripheral market into a bottleneck battle for market share, often regardless of price. "CDC seems to be holding its own in pricing, but the peripheral business is nothing to write home about," he said.

The investment community consensus is that CDC must accelerate its recent pattern of consolidation and divestiture to retain a fighting chance at keeping its financial ship afloat. "I think they are trying to do that," Fram said. "The sense of urgency is there."

From page 1

Washington eases AT&T computer sales structures

will be used to determine general marketing policy. He said AT&T hopes the FCC will continue renewing its structural separation conditions from other parts of AT&T's business, citing in particular its enhanced service offerings, which will continue to be marketed through AT&T Information Systems.

There will be no immediate "radical reorganization, nor do we anticipate any significant new downsizing of our force because of this action," Marshall said.

Donald J. Harrold, a Washington, D.C., attorney and spokesman for the International Communications Association (ICA), which represents large telecommunications users, reacted to the FCC's move by saying the association wants to see details of AT&T's accounting plan before making a judgment. "This is the key to lifting the separation requirements. There is obviously going to be some subsidy [of equipment sales and transmission], but the question is how much and to what degree."

In a separate move, the FCC denied AT&T Communications' request for permission to proceed with an optional discount pricing plan, Pro-American, which would have awarded users a 15% discount on all direct-dial long-distance calls for a flat \$25 monthly fee. The requested tariff was not supported by demand figures supplied by AT&T, the FCC ruled.

The FCC conditioned its permission, allowing AT&T to drop the separate subsidiary requirement for the marketing of terminal and computer equipment — the heart of its Second Computer Inquiry decision policy — on AT&T's network to establish an equipment manufacturer's own local distribution plans. The FCC will have to approve these plans before the new policy can go into effect.

First, AT&T will have an obligation to disclose to its competitors changes in technical interconnection standards to its core network at the time it is ready to make a make/buy decision. Competing equipment organizations will have to sign a non-disclosure clause if they are seeking to bid for one of AT&T's contracts. If they do not sign, AT&T must publicly disclose its planned network changes at least six months before they are to go into effect.

Second, the FCC is requiring that AT&T establish an order placement structure to prevent discrimination in the servicing of new orders coming into AT&T for connections to its dominant long-distance network and to ensure that all customers receive the same treatment. The FCC will require monthly reports on installations in this regard.

Third, the FCC will require AT&T Communications to disclose proprietary information on its customers' telecommunications installations if directed by the customer to do so. This gives the customer some power over the selection of a carrier and equipment, the ICA's Harrold said.

The fourth and final condition will require AT&T to set up a cost accounting system to track joint research costs shared between the equipment arm and the transmission portion for AT&T's combined marketing, research and development and sales efforts.

NEWS SUMMARY

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IBM unleashed software that brought its 4700 financial system into the Big Blue office architecture/13

Ansia Software released its Paradox relational data base management system for IBM and compatible micro/12

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The employment levels of most leading mainframe and minicomputer vendors have shrunk or grown only moderately since the beginning of the year/24

The management levels of most leading mainframe and minicomputer vendors have shrunk or grown only moderately since the beginning of the year/24

Nets is planning to use Ada, the high-level programming language, for its space station project's on-board computers/26

James Martin, noted author on information management, urged more automation in MIS to build a knowledge base for the corporation the future/28

IBM Chairman John Opel asserted that foreign governments should stop monopolizing their telecommunications networks and open them to free-market forces/29

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NEWS

From page 1

Macintosh add-on products unveiled as Jobs departs

without having a hard disk drive," according to Lewis.

Hard Disk 20 sits underneath and connects to the back of the Macintosh and can be used with any Mac with 512KB bytes of memory. It is the second hard disk drive to be introduced for the Macintosh in recent months. General Computers, Inc. of Cambridge, Mass., introduced a 20MB hard disk for the Macintosh last month in Boston.

Scheduled for limited availability in November, the Hard Disk 20 can operate twice as fast as a floppy disk drive, a spokesman said. Hard Disk 20 comes with a hierarchical filing system, and the software uses the Macintosh's file folder icons for grouping together related files, a spokesman said.

The product costs \$1,499.

Apple also introduced a version of its dot matrix

printer, ImageWriter II, priced at \$895, can operate up to 360 char./sec. and gives users access to three printing modes.

The printer is said to include an expansion slot for a range of interface boards.

For the Apple II line of computers, the company introduced a 3½-in. floppy disk drive that can store up to 800K bytes of information. Available immediately, Unidisk 3.5 includes systems software utilities for formating and duplicating diskette and for copying and deleting files on a diskette.

It is designed to bridge the gap between Apple's low-end, 143K-byte floppy disk drives and its 1MB-byte Profile hard disk. The Unidisk 3.5 costs \$495.

Other products introduced by Apple include the following:

■ The Apple Personal Modem, a Hayes Microcomputer Products, Inc.-compatible 300/1,200 bps. modem. Currently available, the modem operates at 1,200 bps./sec., 110 bps./sec. or 300 bps./sec.

for compatibility with other networks that require lower speeds.

The modem also uses the Hayes Smartmodem Command Set and can be connected to any personal computer with a standard RS-232C serial port. The Apple Personal Modem costs \$395.

■ Switcher, a utility that allows Macintosh 512K and Macintosh XL users to store up to eight applications in memory at the same time. Switcher also allows users to transfer data between Macintosh applications.

For example, users can copy a graphic from a Macdraw onto a Macwrite word processing document.

Early versions of Switcher were made available by Apple Computer, Inc.'s Micro-Networked Apple User Group and several software developers, including Microsoft Corp., which included the utility in its Excel spreadsheet product.

Individual copies of Switcher are priced at \$19.95, the vendor said.

Two commercial Unix users stand by their systems

By Charles Babcock

NEW YORK — Two large users of AT&T Unix operating systems in commercial settings told attendees at the Unix Expo conference that they think they have made the right choice.

Both said, however, that they had difficulty building a professional staff experienced in Unix.

Steven Stamps, director of development at J. J. Kenney Co., said his firm was trying to download 70% of the transaction processing currently handled by six Perkin-Elmer Corp. superminis onto 150 individual workstations.

J. J. Kenney is a broker of municipal securities for other brokerage houses. Many of the transactions that its computers must process are read-only or informational messages for its traders, and downloading them to AT&T Unix PCs would eliminate the need to expand its central data processing center, according to

Stamps. The firm built a prototype system, and it is being used by six traders, but J. J. Kenney ran into difficulties.

"We found we did have a performance problem. The system became sluggish at 10 terminal users. We had thought that we could run 24," he said.

The development staff had to reconfigure the system to get better response times, Stamps said.

Gene Grant, director of marketing for Quotron Systems, Inc., Los Angeles, said his firm spent five years preparing to market a Unix stock quotation and office automation system to brokerage houses.

One year to convert

According to Grant, Quotron's 80-member development staff spent from 1980 to 1983 building software development tools, including screen managers, window managers, a data base management system and forms manager.

Once the tools were assembled, the staff was able to convert Quotron's stock quote service into the C language in a year.

"It is the Unix system with the tool set that makes productive application development possible," Grant told conferencegoers, many of whom said they were interested in using Unix in their business offices.

Unlike Quotron, J. J. Kenney was able to buy many of the system utilities and the data base management system it needed rather than develop them itself. Availability of those products indicates how the market for Unix has changed in the last five

years, Stamps said.

He and Grant both complained that it is difficult to find experienced Unix programmers and that such programmers were commanding top salaries. A programmer with five years' experience in Unix and 10 years' experience in data processing can earn \$60,000, he said.

Stamps also cited commercial users worry about the "polarization" between System V, which AT&T is promoting as a standard, and University of California at Berkeley's Version 4.2, which some users view as offering a wider selection of enhancements.

Walker Interactive for sale?

Major software firms most probable bidders

By Maureen McNamee

SAN FRANCISCO — Walker Interactive Products, Inc. is for sale and could be sold within the next several weeks, according to industry sources and analysts.

But much is the official word from the vendor of financial applications packages, once touted for its applications development tools and line of business financial software. Vendors rumored to be interested in the firm declined to comment.

Industry analysts said they heard of the Walker rumor so early as last April, and the software industry's leading vendors are quick to confirm the possibility of a sale. One vendor source said a sale to Management Science America, Inc. (MSA) was imminent, but another said any sale will take some time to finalize.

Potential buyers for the \$30 million company include the industry's largest software vendors, among them MSA, Ashton-Tate & Dodge Corp., Cullinet Software, Inc. and IBM. Analysts have their own theories on the potential sale of the company, which has been troubled with poor sales and steep liabilities during the past several months.

William Shattuck, analyst with Montgomery Securities, put his bet on Cullinet as the most likely buyer of Walker. "It would make a lot of

sense for Cullinet," Shattuck said, particularly in light of Cullinet's legal dispute with McCormack & Dodge over the international marketing rights for Cullinet's General Ledger package, originally purchased from McCormack & Dodge. One source, formerly associated with Walker, said MSA is the likely buyer, a view held by one of MSA's chief competitors.

Shattuck downplays the MSA interest. "It's easier to me [buying Walker] would make more sense for a company that is trying to get into the applications market rather than a company that has pretty much covered all the bases, like an MSA."

Brian Nuttall, a software analyst with Robertson, Colman & Stephens, an investment banking firm here, would not comment on the pending sale of Walker, because of what he said was his firm's financial involvement with Walker Interactive.

Several years ago, Nuttall said, Walker was viewed as a fast-track company that developed a solid reputation for its interactive software applications.

Launched as a consulting company by Jeffrey Walker in the mid-1970s, Walker initially attracted several venture capitalists and was reborn in 1980 as Walker Interactive Products. Shortly thereafter, the company recorded 200% annual sales growth on the strength of sales of its Integrated Interactive Financial Systems.

Computerworld staff writer John Dermond also contributed to this report.

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Run With The Leader

News page 1

Productivity key concern at Software/Expo conference

and applications development without programmers. We are simply selling old technology repackaged."

DP and MIS managers interviewed at the Software/Expo last week expressed concern about improving productivity, and many said they plan to do it with personal computer software ranging from decision support to graphics packages.

Jim Grayson, MIS manager with Standard Mett Co. of Fort Worth, Texas, said he was looking for a package to offer distributed graphics on a personal computer to free up demand on the mainframe. "Graphics is a big CPU hog," he said.

Decision support software was being sought by Steve Chaney, information center manager for Standard Mett. The company's information center has worked well for middle management, "and now I want something easier to use for upper level

executives," Chaney said. "At the executive level, they need more of a presentation system than something to develop applications with."

Controlling the proliferation of personal computers is a chief concern of Michael Friedlitz, technical services manager in the Los Angeles State Department of Land and Natural Resources. "More and more people are getting personal computers. My unit has to keep up with all that and try to provide better mainframe links and support," he said.

"One thing I want to look at is the information center concept to see if we can slow the need for links" and prolong the useful life of his mainframes, he said.

George Connor, systems analyst at the Sandia National Laboratories, Kirtland Air Force Base, Albuquerque, N.M., said he wants to quicken the pace of application development by having users do more on their own. "Our financial systems are all implemented, but the users want more," he said, pointing out his backlog. Recent research at the laboratory, which has a development and sup-

port staff of 100, showed that half of the staff's time is spent maintaining legacy applications.

Gene Ouellette, systems manager for Boeing Aerospace Co. of El Segundo, Calif., is hoping to collaborate with help his distributed applications to end-users and allow users to write all local applications. "We are trying to do this with personal computers and fourth-generation languages," he said.

Not surprisingly, users made their way to Dallas' Infrastrat to learn more about fourth-generation languages, relational data base management systems and other products lumped under the banner of productivity tools. DBMS was born more than a decade ago, but it remains a basic concern of users who must integrate applications developed over a span of three decades. Software/Expo attendees seemed to offer just what these users were looking for: They focused primarily on day-to-day issues such as development, maintenance, DB management and the optimum use of productivity tools like DBMS and fourth-generation languages.

News page 1

Cincom announces relational DBMS for IBM mainframes

for IBM mainframes.

In the previous decade, Cincom took the early lead in the DBMS race with its TIB product. But in recent years, the Cincinnati-based vendor has fallen behind such rivals as Cullinet Software, Inc. and Applied Data Research, Inc. (ADR) in the independent DBMS market. (IBM still dominates the market over the DBMS market, but Cullinet and ADR have steadily boosted market share gains over Big Blue.) Cincom is trying to turn that around with the debut of its Superior Relational Architecture (Supra) "advanced" relational DBMS.

According to Cincom President Dennis Yablonsky, the advanced aspect of the product is that it implements the American National Standards Institute's ideal DBMS model. Although the model drafted by the institute's Standards Planning and Requirements Committee — which was made up of representatives of major hardware and software vendors and some of the largest U.S. companies — is more than a decade old, Yablonsky said Cincom has become the first vendor to implement it fully in a commercially available relational system. Yablonsky hosted the company's multimedia press unveiling of Supra during the Software/Expo conference held in the Infrastrat facility.

Yablonsky said Supra meets the committee's requirement that a relational DBMS incorporates a three-schema architecture. That means the system maintains three independent definitions (schemas) of data: an external data view, a conceptual view that defines data in table form and an internal or physical view of how data is managed and stored. He said most relational DBMS, including Cullinet's IDMS/R, ADR's Datacom/DB and Cincom's existing TIB product, currently only support a two-schema architecture.

In addition to leading Cincom's renewed attack on the DBMS market, Supra has also become the flagship of the company's newly focused product line. Under the banner of TIB/XA, Supra joins Ultra, the company's Digital Equipment Corp. VAX-based DBMS; its Mantle applications development system; its Control series of manufacturing and financial applications; and its Net/Master and PC/Console network management systems.

"TIB/XA is intended to automate the automation process," Yablonsky said. "Supra shows that we are in the DBMS market to stay. We intend to take back our rightful place through aggressive development and marketing."

The three-schema design, Yablonsky said, automates a variety of functions, relieving programmers and data base administrators from writing teleprocessing monitor code, basic navigation and derivation logic and data integrity code. By separating the conceptual data view from the physical view, he said, Supra eliminates data redundancy, allows for the enforcement of data integrity constraints and enables users to restructure the physical data base without modifying existing applications.

Supra consists of five components. The Spectra information retrieval and application development system, which customers got a sneak peek at dur-

ing Cincom's recent Directions '85 conference, enables end users to access data through nonprocedural commands. The Normal data base administration tool automates logical and physical data base design through a set of tools that assist the data base administrator.

According to Yablonsky, the Relational Data Manager component supports the three components of the relational data model: relational structure, manipulation and integrity. Manipulations

include the SELECT, PROJECT and JOIN commands that must be supported in a true relational DBMS. Supra's Physical Data Manager supports all data structuring techniques such as indexing, chaining, sequential and flat file. Yablonsky said the component was designed to reduce physical I/Os and ensure high performance. He said the data manager also supports on-line dynamic file allocations or deallocations for nonstop processing. Supra integrates data in the data manager and native IBM VME files, providing users access to data in existing VME-based applications.

The final component, the In-Line Directory, controls data access, security and applications development. It maintains information about users, programs, views and data definitions and integrates all Supra components.

Supra, available now, costs \$145,000 for IBM DOS/VSE and \$216,000 for MVS or MVS/XA.

Limited product debuts seen at Software/Expo

DALLAS — With the introduction of its Superior Relational Architecture relational data base management system, Cincom Systems, Inc. of Cincinnati led the rather slim pack of software vendors unveiling products at last week's Software/Expo conference.

While not introducing a software offering, Virginia, Va.-based Boeing Computer Services Co. announced site licensing options for all of its microcomputer software products and for some of its mainframe tools. At its Infrastrat press briefing, the company said it will offer unlimited rights-to-copy options for one company site or for a group of sites to provide more purchasing flexibility for its customers.

Citing the recent controversy over software copying, Boeing said it wanted to take a firm stand and address larger organizations' need to overcome copy protection limitations. As an example of how the pricing schemes would reduce costs, a spokesman said a buyer could save more than 90% on the single-copy price of the Boeing Calc package, depending on the pricing plan chosen. Boeing will provide reproducible diskettes and cameras

ready copies of documentation.

Provenco Planning Associates and Systems, Inc., both of Dallas, jointly announced Data Center Manager/1. The product, designed to run on an IBM PC, provides aids to professionals in the management of computer applications, software and systems. Data Center Manager/1 offers an inventory data base that supports disaster recovery planning, budgeting and forecasting, configuration management and component failure analysis.

The package consists of separately priced basic inventory, budgeting, configuration and maintenance modules. Basic inventory is available now for a one-year license fee of \$4,995. Other modules are scheduled to be available later in the year at prices to be announced.

Austin, Texas-based Data Interface Systems Corp. announced its DI-3270/L product for IBM 3270 Personal Computer terminals. A spokesman said the products use local-area network technology to enable site-to-site communications and that one or more micros in the network serve as gateways to a host system, acting as an IBM 3270 controller. All micros in the network act as 3270 terminals and 3270 printer controllers, with up to four logical units supported at each node.

A stand-alone implementation of the system is also available. Currently available for biynchronous systems, DI-3270/L will reportedly support IBM's Systems Network Architecture in 1986. Pricing ranges from \$650 to \$950 per node. Standalone version pricing starts at \$300.

Arlington, Texas-based Southwest Software Services, Inc. introduced Version 3 of its Zeks — The Controller automated scheduling and dispatching system for batch jobs under IBM's DOS/VSE and MVS operating systems. Enhancements enable automatic reply to job messages to be defined to the system along with the reply Zeks to be used. Dates and critical run parameters can be cataloged, checked, verified and automatically entered by Zeks when a specified program requests the information.

In addition, an on-line security system has been added, and multiuser support enables the Zeks data base to be shared between DOS/VSE, MVS and CMS. The DOS/VSE version of Zeks costs \$11,500, and the MVS version costs \$19,500.

AI Lee & Associates, Inc. of Dallas announced enhancements to its Major on-line applications development system for IBM OS and DOS users. A utility function has been added to generate data file definitions automatically from existing Cobol copy book definitions. The system's access method transparency feature has been expanded to support IBM's VME, Lince and Prism and Applied Data Research, Inc.'s Datacom/DB.

Major costs between \$28,000 and \$72,000, depending on configuration and operating system.

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All seminars through December 31 are listed below. Call for information on later seminars.

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CULLINET SEMINARS/U.S. FALL/WINTER 1986

State, City	Date	Database Management Systems (DBMS)		Information Center Management Systems		Applications	
		Relational	Hierarchical	Relational	Hierarchical	Financial	Human Resource
ALABAMA							
Birmingham	11-15-86	■		■		■	■
Montgomery	11-16-86	■	■	■		■	
ARIZONA							
Phoenix	9-26-86	■					
CALIFORNIA							
Los Angeles	9-24-86	■	■	■	■	■	■
Orange County	9-25-86	■	■	■	■	■	■
Sacramento	9-26-86	■	■	■	■	■	■
San Diego	10-23-86	■	■	■	■	■	■
San Francisco	9-26-86	■	■	■	■	■	■
San Jose	9-26-86	■	■	■	■	■	■
COLORADO							
Denver	11-12-86	■	■	■	■	■	■
CONNECTICUT							
Hartford	11-26-86	■	■	■	■	■	■
DELAWARE							
Wilmington	9-25-86	■					
DISTRICT OF COLUMBIA							
Washington D.C.	11-27-86	■	■	■	■	■	■
FLORIDA							
Tampa	9-26-86	■	■	■	■	■	■
Orlando	9-27-86	■	■	■	■	■	■
West Palm Beach	10-27-86	■	■	■	■	■	■
TRINIDAD							
Trinidad	11-26-86	■					
GEORGIA							
Atlanta	11-13-86	■	■	■	■	■	■
HAWAII							
Honolulu	11-26-86	■					
ILLINOIS							
Chicago	9-26-86	■	■	■	■	■	■
Chicago	11-4-86	■	■	■	■	■	■
INDIANA							
Fort Wayne	9-27-86	■	■	■	■	■	■
Indianapolis	10-13-86	■	■	■	■	■	■
South Bend	10-23-86	■					
IAWA							
Den Moines	10-6-86	■	■	■	■	■	■
MAINE							
Portland	10-27-86	■					
MARYLAND							
Baltimore	10-11-86	■	■	■	■	■	■
MASSACHUSETTS							
Boston	10-12-86	■	■	■	■	■	■
Burlington	9-24-86	■					
MICHIGAN							
Detroit	10-14-86	■	■	■	■	■	■
Grand Rapids	10-15-86	■	■	■	■	■	■
MINNESOTA							
Minneapolis	9-26-86	■	■	■	■	■	■
Mississippi	11-12-86	■	■	■	■	■	■
Jackson	11-4-86	■	■	■	■	■	■
MISSOURI							
Kansas City	9-24-86	■	■	■	■	■	■
Kansas City	11-13-86	■	■	■	■	■	■
NEBRASKA							
Omaha	10-19-86	■	■	■	■	■	■
NEVADA							
Sparks	9-26-86	■	■	■	■	■	■
Provo	10-12-86	■	■	■	■	■	■
NEW MEXICO							
Albuquerque	10-16-86	■					
NEW YORK							
Albany	11-7-86	■					
Long Island	10-24-86	■	■	■	■	■	■
New York	11-1-86	■	■	■	■	■	■
New York	9-25-86	■	■	■	■	■	■

State, City	Date	Database Management Systems (DBMS)		Information Center Management Systems		Applications	
		Relational	Hierarchical	Relational	Hierarchical	Financial	Human Resource
NEW YORK							
Rochester	10-18-86	■		■		■	
Syracuse	11-15-86	■		■		■	
North Carolina							
Charlotte	10-26-86	■		■		■	
Greensboro	10-28-86	■		■		■	
NC STATE							
Charlotte	9-26-86	■		■		■	
Greensboro	10-13-86	■		■		■	
OKLAHOMA							
Oklahoma City	10-5-86	■		■		■	
OKLAHOMA CITY							
Oregon	10-1-86	■		■		■	
Portland	10-1-86	■		■		■	
PENNSYLVANIA							
Philadelphia	10-1-86	■		■		■	
Pittsburgh	10-18-86	■		■		■	
PENNSYLVANIA							
PROVIDENCE							
Providence	11-4-86	■		■		■	
RHODE ISLAND							
PROVIDENCE							
SAFETY CAROLINA							
Charleston	9-26-86	■		■		■	
Charlotte	11-7-86	■		■		■	
Greenville	10-1-86	■		■		■	
SCOTTSVILLE							
Scottsville	10-26-86	■		■		■	
TEXAS							
Austin	10-1-86	■		■		■	
Austin	12-4-86	■		■		■	
Austin	12-11-86	■		■		■	
Brownsville	11-5-86	■		■		■	
Houston	9-24-86	■		■		■	
Lubbock	10-17-86	■		■		■	
San Antonio	10-20-86	■		■		■	
Tyler	10-18-86	■		■		■	
UTAH							
SALT LAKE CITY							
SALT LAKE CITY							
VERMONT							
Lyndonville	10-17-86	■		■		■	
Montpelier	11-12-86	■		■		■	
WICHITA FALLS							
WICHITA FALLS							
WISCONSIN							
Milwaukee	10-25-86	■		■		■	

CULLINET SEMINARS/CANADA FALL/WINTER 1986

Province, City	
ALBERTA	
Calgary	10-17-86
Edmonton	10-25-86
MANITOBA	
Winnipeg	11-28-86
NOVA SCOTIA	
Halifax	10-23-86
ONTARIO	
Ottawa*	9-26-86
Ottawa*	10-13-86
Toronto	9-24-86
Toronto	10-18-86
QUEBEC	
Montreal	10-30-86
Montreal	11-18-86
Quebec City	11-5-86
QUEBEC/NEW BRUNSWICK	
Regina	10-5-86

*Topics: Financial Accounting

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Cobol 85 standard wins Ansi approval

By John Gilbert

Cobol 85 is a U.S. standard at last. The American National Standards Institute (Ansi) gave its final approval to the proposed language upgrade less than one month after receiving the Cobol 85 standard document from its drawers.

In a somewhat-surprised move that surprised even insiders (CW, Sept. 16), Ansi's Board of Standards Review approved the Cobol 85 standard through letter balloting that ended Sept. 10. According to Dorothy Hogan, vice-president of communications for Ansi, 11 members of the 13-member review board voted to approve the standard; one ballot was not returned.

The Board of Standards Review received the Cobol 85 draft standard from Ansi's X3 committee — primary drafters of the upgraded language — in late August. X3 committee members told Computerworld at that time they were not expecting a final vote on the document until later in the year.

Committee members received no special notification of final approval and only learned of the vote through a periodically distributed Ansi publication.

"We're glad to know that we now have an American standard," said Jerome Garfinkel, a member of the Ansi X3J4 Cobol subcommittee and founder of Jerome Garfinkel Associates, Inc. "But the news comes as something of a surprise. It points out one of my greatest disapprovals with the whole standards procedure. Even as a member of the Cobol committee, it has been very difficult to find out what stage the document was at and when it was to be approved."

According to Ans's Hogan, the Board of Standards Review's vote set in motion a 30-day period during which people can appeal the approval. But, she said, no objections have yet been received.

The Cobol 85 standard now awaits only final International Standards Organization approval, a step expected before year's end.

TOP OF THE NEWS

Continued from page 1
at Moffett Field, Calif. For more on the Cray X-MP, see page 4.

Ranks of IBM Personal Computer AT clones can soon swell with an entry from Hewlett-Packard, a manufacturer currently controlled by Viceroy. The system, which could debut in the next few days, is said to be priced lower than the AT and to offer a floppy-disk controller and up to 840K bytes of memory. HP will also toss in its line of specialised graphics cards and monitors, making Viceroy suitable for computer-aided design and manufacturing tasks.

The saga of the IBM PCjr continues. Last week the company told its employees that they could purchase the erstwhile Peanut, complete with color monitor, disk drive and three software programs for a bargain-basement price of \$450. The original price tag for the PCjr was in the \$1,200 neighborhood. To reduce inventories further, currently estimated to be well in excess of 100,000 units, IBM is expected to flood retail outlets with PCjrs just in time for Christmas shopping and with a low price of about \$600. Last Christmas they cost approximately \$750.

A couple of weeks after Apple Computer Marketing Vice-President William Campbell pronounced the demise of the Macintosh Office concept ("We don't have the products to sell the Mac Office"), at the Macworld Expo in Boston, Apple pops up on the CBS network presentation of *Death of a Salesman* advertising ... Mac Office. Actually, there is a nice counterpoint between the two seemingly clashing episodes: Picture beagued salesmen Campbell as a high-tech Willy Loman and Mac Office as a system that is liked but not well liked. For more on Mac and Apple, see page 1.

Ulric Weil, principal at Morgan Stanley & Co. and experienced IBM watcher, said that IBM booked \$6 billion in orders for its 3000 mainframe line in the second quarter of 1985. These orders were so significant in and of themselves, Weil said, that the computer industry as a whole was able to post a 13% increase over 1984's second quarter.

It was a busy week for bitonal data base ballyhoo. On the East Coast, the principals in a new company called Ansia Software — President Steve Dow and venture capital angel Ben Rosen — visited prospective corporate clients, dealers and trade press reporters to beat the drums for their Lotus Development Corp. 1-2-3-compatible micro data base management system Paradox. And out west, Symantec Corp. — headed by former Lotus and Microsoft Corp. executive Vern Raburn — finally released its integrated Q&A package, which includes a data base function and a natural-language front end. More on both products, page 12.

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IBM software targets 4700 system, mainframe Unix

By John Gullatt

IBM last week unleashed software that brought its 4700 financial system into the Office Systems architecture and offered an array of applications and development tools for its mainframe Unix operating system.

IBM's introductions brought yet another processor — the 4700 Personal Computer — into its strategic DIA and Distributed Office Support System (Doses) linked family of products. In addition, the products for the IX/370, IBM's VM-hosted implementation of AT&T's Unix System V, seemed to signal an intention on IBM's part to make IX/370 a more viable operating system alternative.

An IBM spokesman said the announcement of 4700 Personal Computer Office Systems support provided an initial offering of access to DIA distribution services for users in a 4700 system environment. He said that through compatibility of IBM Personal Computer products, including Personal Services/PC, on the 4700 Personal Computer, "a broad base is established for continuing IBM 4700 Office Systems support" — a statement that paves the way for other 4700 financial system products to be brought into the Office Systems fold in the future.

With Personal Services/PC running on a 4700 Personal Computer or a Personal Computer attached to a 4700 Controller, users gain access to DIA distribution services to and from Doses on a host processor. Distribution services refers to the sending and receiving of messages, documents and Personal Computer files.

Text documents created on the 4700 Personal Computer running Displaywrite 2 or 3 and Personal Services/PC can also run Doses for distribution. Dose support will be available when the company introduced RM4700CTL8 package for the 4700 controller and 4700 Personal Computer Application Services package becomes available later this month. Pricing is based on individual product prices.

IBM's nine IX/370-related announcements included the following:

■ IX Cobol (\$6,000), a version of Austin, Inc.'s ACE Cobol modified to operate under IX/370. It supports record and file locking and is based on American National Standards Institute's (Ans) Cobol 74 standard.

■ IX Basic (\$3,500), an Ans Minimal Basic standard compiler and interpreter.

■ IX Pascal compiler (\$4,800), a

With Personal Services/PC running on a 4700 Personal Computer or a Personal Computer attached to a 4700 Controller, users gain access to DIA distribution services to and from Doses on a host processor.

Unit implementation of Pascal that allows users to compile and execute Pascal programs under IX/370.

■ IX Prochart (\$16,000), a version of Visual Engineering, Inc.'s Visual Prochart. It allows users to create business graphics and is based on the

Auto Graphics Kernel Standard.

■ IX Integrated Word/Math (\$12,000), integrated office automation software that was previously announced for the IBM Personal Computer.

■ IX Ultracalc (\$10,000), devel-



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Ansa offers Paradox IBM-compatible relational DBMS

By Dennis Rehmstedt

A microcomputer data base management package from Ansa Software with the ability to import Lotus Development Corp.'s 1-2-3 data directly into its data table was scheduled for release and shipping today.

The Paradox relational data base management package for IBM and compatible microcomputers is the first product from Ansa, a company backed by venture capital firms Kleiner, Perkins, Caufield & Byers and Sevin Rosen Management. The latter is a principal backer of Lotus and Compuq Computer Corp.

Paradox uses machine reasoning features to evaluate user requests and to write programs that seek the fastest route to an answer, according to Stephen M. Dow, president of the company and a partner on leave of absence from Sevin Rosen. In an interview last week, Dow said the package will

be shipped through dealer channels immediately and will sell for \$495. The company does not plan any direct sales, he said.

Lotus 1-2-3 should be called a benefit.

Paradox's similarity to 1-2-3 is a major benefit to users, according to beta test site user Leslie Pollett, director of software management at Micromentor, Inc. in Cambridge, Mass. It allows 1-2-3 users to learn Paradox easily, she said.

Paradox is said to handle information management problems through query by example, program synthesis and heuristic query optimization techniques.

Data from a variety of sources can be integrated into Paradox, the vendor said.

The software's built-in programming language, PAL, is said to enable users and programmers to develop turnkey applications that meet their spe-

cific needs.

Paradox uses tables to display information in rows and columns. The columns hold categories of information while the rows show individual records. Each table or file can contain up to 990 million characters — formatted in 65,000 rows and 255 columns, with 4,000 char./row and 255 char./col.

A form is used to display data when working with information about one record. Any change made in the form is reflected immediately in the table. Forms can have borders, boxes and annotations on the screen.

Query forms on the screen enable users to retrieve, select or perform calculations on information in the tables. Users question their data by checking off columns and selecting rows.

Reports can be user designed or employ the Paradox program's standard reports.

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Symantec package out

By Jeffry Spector

PALO ALTO, Calif. — A closely watched four-year-old software company last week released its first product, an integrated data base, word processing and report generator package that will see a natural-language interface, according to its developer, Symantec Corp.

The Cupertino, Calif.-based vendor's Q&A product will reportedly unite its data base, word processing and report generator functions to allow users of IBM or IBM-compatible micros to produce documents that draw their contents from two or more sources.

To perform tasks such as writing memos or updating data bases, a user summons a high-level menu that lists Q&A's constituent modules — the File data base, Report format generator and Write word processor. The user then simply selects the menu heading for the desired module.

Q&A uses its natural language interface to create and update data bases without moving to other programs or swapping disks, the company said.

Q&A's natural language capability resides in the product's "Intelligent Assistant," which enables users to create, populate, edit and update data bases with English language commands rather than with a formal query language.

According to beta user Jay Yamada, who serves on the board of directors for KQED, San Francisco's public television station, the station has used Q&A for about two months. "I would typically spend two to three days creating [Ashton-Tate, Inc.] Dbase III screens and prompts for Q&A's data base," Yamada said during a private interview. With Q&A he was able to perform the same tasks in about 10 minutes.

Q&A's systems prerequisites include 512K bytes of random-access memory and a choice of either two floppy disk units or one floppy and a hard disk module.

For users who already have 512K-byte IBM-compatible micros, the Symantec package sells for \$299. When Q&A is bundled with a 256K-byte expansion board, the purchase price rises to \$349.

Lotus to deliver remedy for Symphony 1.1 defect

CAMBRIDGE, Mass. — The latest version of Symphony needs some fine-tuning to correct a bug that may cause data to be lost, Lotus Development Corp. revealed last week.

The company said it will send existing users two replacement disks next month to correct the problem.

The bug in Release 1.1 can cause data losses when the user is inserting or deleting rows and columns and moving ranges. The bug was discovered by "quality assurance people and a couple of customers," a spokesman said. Release 1.1 began shipping July 22.

Lotus President Jim Manzi said the company was receiving about 10 complaints a day from Symphony users. At the end of a press conference to kick off version 1.1, the company's Signal product [CW, Sept. 16], Manzi decided to say how many copies of the program had been shipped with the bug in it, although all those copies sold since the version was released contained it, he said.

According to Manzi, not every user of Symphony would have experienced the defect, although it may occur during use of common spreadsheet functions, including inserting and deleting data or transferring numbers between sections.

Stephen J. Crumsey, vice-president of sales and service, downplayed the problem, calling it "not a big deal." The fix for the Symphony

version that came out on July 22 is not totally resolved, he said. The company will probably swap two of the six diskettes in the Symphony package. The solution will be out in early October at no cost to registered users, Crumsey added. An updated version of Release 1.1 will be shipped to dealers within the next week.

In the meantime, users can minimize the risk of losing data if they save their worksheets before using the INSERT, DELETE or MOVE commands, a spokesman said.

One user told Computerworld that Symphony has an additional problem with its color features. Release 1.1 is supposed to show both text and graphics in color, according to Russell Beris, project analyst at Internef, Inc., of New York who has had the version for about three weeks. When used with an IBM Personal Computer AT or a Compaq Computer Corp. Deskpro 300, the color does not come through on text, he said, adding that Release 1.0 did color the text. Beris said he told Lotus about the problem and was informed a fix would be sent when available.

A spokesman admitted that Release 1.1, when used with IBM's color card and a color monitor, can produce black and white text for some users. That glitch, along with other bugs that have been reported by users since the package was released, will be corrected in the forthcoming fix.

TCA crowd in buying mood

By Paul Koenigswald

SAN DIEGO — There was little evidence of a stamp at the Telecommunications Association 1988 conference last week where crowded aisles made it difficult to walk around, and users said they were in a buying mood.

The show attracted 260 vendors, up from 230 in 1984, and the association predicted attendance would total 10,000 people, up from 12,700 last year.

The audience seemed to be equally divided into users and vendors, with large contingents from MCI Communications Corp., AT&T and Pacific Bell.

Users interviewed by Computerworld were in a buying rather than a browsing mood. Most were evaluating products that had been previously introduced. Only one product announced at the show was mentioned by a user as a probable purchase. J. P. D'Amico of the Los Angeles Police Department expressed an interest in T-1er, Inc.'s 2001 matrix switch. He was not interested in a similar offering IBM unveiled a week before the show. "We are staunch supporters of [Digital Equipment Corp.] equipment," D'Amico stated.

Richard P. Schoettler, Jr., a program manager at Guidel Management Co. in San Diego, was evaluating all the hardware necessary to link his company's IBM System/36 to remote offices. His shopping list included modems, multiplexers and common-carrier services. "I was sur-

prised that satellite equipment had programmed so much," he noted. "The satellite companies seem to have solved the problem of voice delay."

Nick Cook, vice-president of telecommunications at First Nationwide Corp. in San Francisco, was checking to make sure that he didn't overlook any item necessary when his company installs its first T1 line next month. "My best advice has come from other users when I met during lunch," he said.

Other attendees were interested in products that would enable them to squeeze more performance out of existing equipment. John G. Gacki Jr., director of telecommunications operations at the Chicago Board Options Exchange, bought a private branch exchange in 1985. At the show, he was searching for a call management software package that would enable him to determine how that private branch exchange is used. Call management packages store data from local and long-distance calls and produce a number of reports that help managers determine if telephone lines are needed or telephone services could be eliminated.

Network management packages supply the same type of capabilities as those used with data networks, and Keith Palmer, communications systems manager at California Castaway Management Co. in San Mateo, Calif., was inspecting those offerings. "The network diagnostic products included more features than I would have expected," he said.

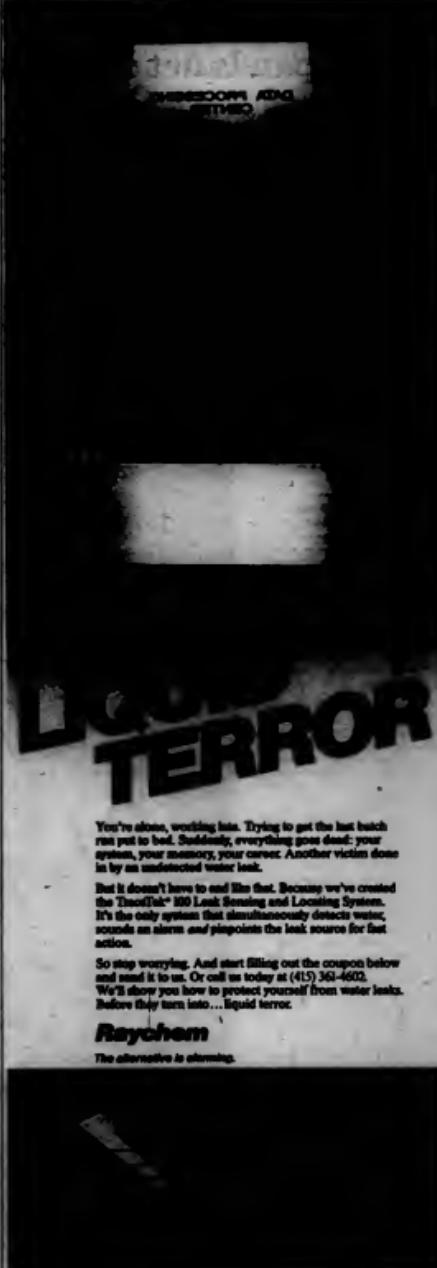
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IBM expands net strategy with protocol converters

By John Biggs

NEW YORK, N.Y. — Driven by the need to make support of Personal Computer and minicomputer networking into its mainstream networking strategy, IBM last week announced two new protocol conversion devices.

The announcement involved the 3708 network conversion unit and an eight-port communications adapter for a previously announced network controller. Both devices convert asynchronous ASCII data streams into IBM's Synchronous Data Link Control (SDLC), the protocol of its Systems Network Architecture (SNA), and provide full screen 3270 data format emulation.

These announcements come one year after the unveiling of IBM's first two major products in this area, the 7171 ASCII Device Attachment Control Unit and the 3710 Network Controller.

Analysts said IBM has little choice but to broaden its support of asynchronous ASCII communications because that is the natural protocol of its widely used Personal Computer. It also opens the door to the synchronous EBCDIC realm of IBM for users of typical minicomputer peripherals such as asynchronous ASCII terminals, printers and plotters.

Two-part devices

The new 3708 network conversion unit is a 10-port device that can be configured with one or two host links, leaving, respectively, nine or eight ports to support asynchronous ASCII devices. Besides performing the ASCII-to-SDLC conversion, the \$4,500 unit provides full screen 3270 emulation.

ASCII devices, which can be located up to 4,000 ft from the 3708, are supported at speeds up to 19.2K bit/sec. through RS-232C interfaces. Remote devices can be supported with modems. When the 3708 is configured with two host links, one connecting to an IBM processor and the other to an ASCII host, terminal users can select the desired host through a menu. The 3708 is scheduled to be available next month.

The concurrently announced eight-port communications adapter provides the same protocol conversion functions as the 3708 but as an internal card option for the previously announced 3710 Network Controller. The 3710 accommodates three types of protocols — SDLC, IBM's Binary Synchronous Communications protocol and selected asynchronous protocols — over one SDLC or X.25 communications link.

While the 3710 previously supported asynchronous data streams, it did not pro-

vide protocol conversion. The 3710 can be outfitted with seven of the new \$3,300 communications adapters — slated for delivery in the first quarter of 1986 — to provide up to 56 ASCII ports. From the host side, the ASCII devices look like 3270 devices attached to a Physical Unit Type 2 3274 cluster controller.

"IBM has to support ASCII because of the [Personal Computer] and the need to coexist in multivendor shops," according to Dave Mischella, director of computer market planning services at International Data Corp., a market research firm in Framingham, Mass.

Besides Personal Computers,

IBM has turned to asynchronous ASCII communications with its System/36, said Peter Lowber, director of information systems with the Tandem Group, a Boston-based consultancy. "It might make sense to use ASCII locally in these environments," Lowber noted, "and 3270 to access the corporate data base."

IBM's intentions are not so benevolent, in the view of Dale Kornick, an independent consultant in Wayland, Mass.

"IBM wants to push SNA as a standard further down into corporations. That means it is going to have to support asynchronous ASCII, non-IBM devices to a much greater extent," he said.

HOW TO
MAKE A
GREAT
IMPRESSION
AT THE
OFFICE

Justice pushes stronger computer crime law package

By Michael Buisse

WASHINGTON, D.C. — The U.S. Department of Justice last week offered anew its computer crime legislation, as part of a package of eight bills attacking white-collar crime and contract fraud.

The computer crime legislation is virtually the same as the administration bill of

February last year (S. 2940). U.S. Attorney General Edwin Meese III said the Federal Computer Systems Protection Act of 1985 would repeal and replace the "incomplete and flawed" computer crime legislation enacted by Congress last year.

The Justice Department's bill would make it a federal felony to engage in computer

fraud or theft or to damage computer hardware or data when the offense involves computers used by the U.S. government, federally insured financial institutions or private businesses engaged in interstate or foreign commerce.

The Justice Department repeatedly has attacked the Computer Fraud and Abuse

Act of 1984 enacted by Congress — and drafted mostly by the House Subcommittee on Crime — for technical and drafting flaws. The statute outlaws unauthorized access to data stored in federal government computers (CW, Oct. 11, 1984).

Sen. Strom Thurmond (R-S.C.) and Rep. Hamilton Fish Jr. (R-N.Y.) are expected to

introduce the package for consideration by Congress' Judiciary committee.

Meanwhile, Sen. Patrick J. Leahy (D-Vt.) is on the verge of introducing the Electronic Communications Privacy Act (CW, Aug. 12), according to an aide.

In a recent speech to the Electronic Mail Association, Leahy said the bill provides civil and criminal penalties for unauthorized access to the contents of a communication system if data is obtained or altered — and provides civil remedies for the unauthorized disclosure of the contents of an electronic message.

IBM blasts apartheid

By Dennis Redmond

ARMONK, N.Y. — Escalating civil unrest and the economic uncertainties of doing business in South Africa prompted IBM last week to issue a strong statement demanding that the South African government address the problem of apartheid.

The statement harshly criticized the unbending policies of apartheid that, the company said, are undermining the business climate there. "We have stated that we believe economic activity can facilitate positive social change," IBM said. "We are following this principle when we say we intend to remain in South Africa as long as we can maintain an economically sound business and as long as there is a chance that we — together with others — can contribute to peaceful change."

But IBM said it is "very disengaged by the current political situation and the resulting uncertainty of investment in South Africa, which are reducing the chances of meeting those objectives."

IBM also said the government there has not shown progress in dealing with its problems. "The rapidly deteriorating situation is having a significant impact on IBM's South African business as well as business in general in South Africa," IBM said. "It is imperative that the South African government address the problems of apartheid with the compelling and urgent attention they deserve."

The statement goes beyond previous IBM pronouncements on apartheid and, according to IBM spokesman Michael Dutton, was prompted by business instability caused by companies taking their businesses to foreign competitors in fear of U.S. policy restrictions.

With the Hewlett-Packard LaserJet printer

Page 2
1985-86 Marketing Report

Indicating a lower overall risk than had originally been projected.

Market Penetration

Since introduction in 1976, the product has experienced tremendous growth in all geographical areas. In fact, the only open-to-business categories measured Q1-Q3 1985, what the rate of penetration reached at a total of 5.2% market share by the leading companies (See Fig. 1).

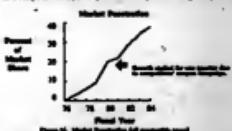
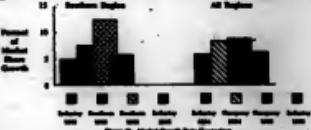


Figure 1. Market Penetration (all geographical areas)

All regions are contributing to this growth, especially the Southern Region, which is experiencing a growth in market penetration far greater than the industry average. In the last three years, the Southern Region has experienced a remarkable rate of growth in market penetration, from just 2.5% in 1982 to 11.5% in 1985. The Southern Region and overall market performance with industry growth.



This would indicate that the increased effort directed at the market in the South has paid off well. In other areas less clearly.

Impact on Profitability

After expenses for the new dealer program, profit has increased 20% in the Southern Region. In the other regions, profits have held steady. This indicates that the RDX for dealers increased

HEWLETT PACKARD

VIEWPOINT

EDITORIAL

The computer did it

A month ago we reported that a faulty computer modeling program was possibly to blame for Union Carbide Corp.'s failure to warn adequately neighbors of its Institute, W. Va., plant that a cloud of toxic gas had escaped. [CW, Aug. 19].

According to these initial reports, a computer modeling program from Safety Emergency Systems, Inc. incorrectly predicted the gas cloud would remain over the plant. The vendor denied its program was at fault and contended that incorrect data was fed into the model. Union Carbide acknowledged that substitute data was used for the chemical that was thought to have escaped.

Plant supervisors first thought toxic aldicarb oxime gas was released. Data was prepared for the model on only three chemicals, and aldicarb oxime was not one of them. So an operator made the closest approximation and entered data on that chemical.

In the informed, emotion-charged (remember *Bhopal, India!*) aftermath, it seemed logical to leap to the conclusion that the modeling program made the wrong prediction on the speed and direction the gas cloud would travel because the wrong data was entered. "Garbage in, garbage out," said Gary Gellman, president of Safety Emergency Systems.

Or in the catchphrase solution to so many modern technological mysteries: "The computer did it."

We are quick to blame the bloodless, lifeless, carefully constructed interpreters of ones and zeros when lives are endangered or lost. A similar incident occurred recently when a glitch developed in a space shuttle launch. According to reports, faulty computers would have shut off the shuttle's engines and prevented the craft from ascending into high orbit had not human operators intervened and kept the shuttle climbing. The image was of computers run amok sending the astronauts plummeting helplessly back to Earth. But at this time, the humans prevailed.

Computers haven't taken over yet. They're not smart enough. And, we need to examine our tendencies to give them more credit and more blame than they deserve.

For instance, we learned in a follow-up call to Union Carbide that a broken steam pipe may actually have caused the leak disaster. Running vented steam heated up a tank containing two chemicals, changing the state of the chemicals and increasing pressure in the tank. The operator could not identify the leaking chemical because he apparently had no idea that the chemicals had changed into different states in the tank. For want of a thermostat, perhaps, 136 people were hospitalized.

It may be good news that these recent press reports were initially off the mark. It is not encouraging, however, to recall how quickly and easily assumptions of guilt were made in the first place.

In reality, the Union Carbide incident demonstrated the seeming impossibility of programming for the unpredictable. It's like building the perpetual motion machine. Those in the computer community must take the lead in educating society that computers are limited to the assumptions built into their programs, just as Union Carbide's model was limited by the predictable.



LETTERS TO THE EDITOR

Bulletin board abusers don't rate protection of First Amendment

I must take exception to the editorial, "Hands off," [CW, Aug. 26]. In it, you expressed the opinion that computer bulletin boards should have First Amendment protection.

The computer system that I have responsibility for is currently under attack by a group of people accessing it via a public packet-switched network. The access attempts have come from all over the country, and the hackers have tried to sign on using standard vendor maintenance accounts. It is clear that the information about these accounts is on an underground bulletin board being used for criminal purposes.

Although we intend to prosecute the perpetrators when the Federal Bureau of Investigation catches them, I would have been happier if the problem had never existed. I am not at all annoyed by these "cute little bit bangers," and I will support any and all efforts to force them to behave lawfully, even if their instincts direct otherwise. The removal of temptations presented on bulletin boards seems to be a good start toward this goal.

Stephen M. Rusk
San Francisco

The editorial, "Hands Off!" [CW, Aug. 26], missed the point: Abuse of privacy and property by placing private information on computer bulletin boards is not a fantasy but a very real problem and one that did not exist before computer technology made private codes so critical and so easily and destructively disseminated.

Your position, which stated that because freedoms are often abused by some that the best policy is to ignore them, is surely not relevant to be taken seriously. Legitimate users hardly characterize fairly as "bit bangers ... picking noses" when they hold an extensive hearing on the public's agenda.

These abuses do happen. The Data Processing Management Association (DMPA) is concerned about them, and your newspaper regularly reports them.

The bill that Sen. John Doolittle (R-Calif.) introduced in California does not limit any of the rights protected by the First Amendment. On the contrary, those rights are enhanced by being protect-

ed in a computer environment as they are in traditional media. There is no First Amendment right to invade another's privacy nor to encourage another to do so by publishing the access codes that would accomplish it.

Doolittle's bill addresses this concern and as does the DMPA proposal. The means differ, but the intent is the same.

Donald G. Ingberman
Alameda, Calif.

Manager defends function of memos to organize long-term group projects

Walter Currie's viewpoints expressed in "Mixing the flow of managerial memo" [CW, Aug. 13] are interesting but need a different perspective.

There are several valid reasons for written memos. New ideas are easy to say and to listen to, but later on when action may be required, it is much better to refer to written notes than it is to trust one's memory. Status reports often contain a number of specific points of information such as solutions to past problems, changes in completion dates and so on.

I would certainly argue with some of the numbers that Currie uses to justify his recommendations. Two hours to prepare a one-page memo seems very excessive.

The thought of managing 10 people for one month on a project without written memos scares me. I can't always remember all the details of what I did last week let alone all the ideas encountered in a project of one month's duration.

As a manager, I can read, study and act on written memos and reports much more easily and quickly. Meetings are for questions, discussions and planning. At the end, a written summary of points raised and unanswered can be referred to for future study and implementation at a later time.

I certainly can appreciate Currie's concern for the reduction in paperwork and managerial time. However, the particular examples and recommendations he gave could only encourage less than adequate control that in turn would result in less than satisfactorily completed projects.

Ted Farrell
Albany, N.Y.

VIEWPOINT

Ruminations on communications



LEICHT
SCIENCES
Charles P. Leicht

Let me begin by stating that I've always thought of AT&T as being extremely fair in its practices, and I was against its dismantlement and still feel it to be one of the finest companies in the U.S. or anywhere else.

Nevertheless, one cannot overlook the rising cost of communications at a time when competition is supposed to be bringing it down. Consider the cheery human voice that ends long-distance standard calls with, "Thank you for using AT&T." Although I confess to not knowing the exact number of these numbers, I'll go out on a limb and state that they number at least a million a day — the U.S. has more than 150 million telephones so I feel safe in my guess. At no less than three seconds and sometimes as much as five seconds for each "Thank you for using AT&T," the suggestion that these consume at least four billion seconds of valuable telephone time daily is unquestionably conservative.

Supposedly you can use one of the alternative services that make you dial another number before you dial the one you want or others that make you dial so many numbers for one call that you deserve a medal for doing it right the first time. But these are too demanding as far as I'm concerned: 10 numbers is as many as anyone I know can handle without having to redial after getting someone in

Leicht is chairman of Leicht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Zambia by mistake.

No, friends, I'm not going to file a petition to remove the "thank you" from our telephones — courtesies are hard enough to come by these days, sincere or not.

A sense of humor designed by a robot

What I am concerned about is what's next. And not only from AT&T. Already MCI Mail insists on giving the day's headlines and a lot of advertising when I sign on, and then takes me through a maze

"It's hard to swallow the promises of those that resell AT&T's service; AT&T still makes and sells it best. Why else would virtually all of the U.S. be on it?"

of menus that must have been designed by a robot for a robot with part of the former's circuitry missing — all this in my office in Japan while I'm trying to send a simple message to New York.

The headlines and advertising take 12 seconds. Whether or not this is directly billed to me is never clear, but I'm old enough to know that, as the saying goes, "You don't get anything for nothing in this world." Someone's paying for the creation and transmission of the headlines, the urging to send a tele or two and the sales pitch for Dow Jones — all of which precedes the question of why I signed on to the system in the first place.

On weekends, I get announcements of specials

You know, the kind that we expect to find on the windows of our local deli, but in this case, I'm paying the rest of the window space.

I could go on to mention other systems that insist that I spend my bucks on similar stuff, but it might just bring watchdog lawyers out of their kennels to bark up a storm of indignation based on their arguments on humanity's moral right to switch services if one or another doesn't suit them. Of course, the fact that there's still nowhere to switch to, especially if you want to cross a state's boundary that isn't crossed naturally — communications networks — is a euphemism for AT&T's ever burgeoning long-lines facilities — is hardly noticed.

It's hard to swallow the promises of those that resell AT&T's service; AT&T still makes and sells it best. Why else would virtually all of the U.S. be on it? From my perspective, the pushing of advertising and news on the non-AT&T networks signals that there are still no non-AT&T networks — that is, competition — in our communications industry. How else could our alternative network services purveyors get away with it?

The lesson is learned in the mainframe computer industry wherein others tried to compete directly with IBM by piggybacking on the things IBM did best, namely making IBM computers, cannot be forgotten. Sure, we saved a buck or two by buying the alternatives, but when the whole picture was put together, unless we really knew what we were doing — for example, buying an Amdahl Corp. mainframe and adding processing power to an otherwise IBM system — we were bound to lose out on the deal. The ex-customers of RCA Corp. and Univac can attest to this.

Buy away, my friends. But if the system thinks you too much for doing so or gives you news you've already read at breakfast, watch out. You are paying for it.

Squeezing CPU power: Is the effort worth the return?



THE DATA CENTER
John P. Murray

No matter how well the technical support group does its work in monitoring and fine-tuning information processing hardware resources, and no matter how extensive the factual basis for providing justification to move to a larger mainframe, it can still be difficult to convince senior management of the need to do so.

The facts supporting the need can be marshaled and presented in the most businesslike manner possible, and yet senior management will deny the request. It is likely that the denial will be accompanied by directions to squeeze more out of the installed hardware.

In some instances it is possible, even after a considerable amount of fine-tuning has already been done, to obtain a bit more processing capacity from a heavily loaded mainframe.

An important question should be

raised in such a circumstance — notwithstanding management's directive to do more with the current hardware: What is the real cost of attempting to gain that probably minor benefit?

Provided that the system is indeed well tuned and that it is operating at a high level of efficiency, significant gains in throughput in a particular area are probably going to be ob-

This is the case because much of the total benefit will often be found in major areas; if these areas are addressed first, the gains can be substantial.

Getting results from other areas

Once the more prominent problem areas have been addressed, getting results from other areas will take a great deal of time and effort. And the

isized after the initial 80% or so would have to be questioned.

For example, an adjustment may be made to provide more resources for batch processing. In a heavily loaded system, this probably means that on-line processing receives fewer resources.

Although the net effect may seem, and may indeed be, rather small, spread over a large active network, the result in terms of lost productivity and lowered morale may be significant. It may well be that the adjustment, while speeding up some of the batch processing, will reduce overall throughput.

Minor increases put to better use?

One must ask if the time spent in obtaining this rather minor increase in hardware efficiency could be put to better use elsewhere. The net return on the investment of this time might be much greater if it was devoted to other areas.

The decline in the cost of raw processing power continues. Given that continuing decline, the issue may not be whether there is unused processing power, but whether the potential return is worth the effort expended to harness it.

If, indeed, a 20% effort will produce a 50% return, can an additional 30% or so effort be justified to produce another 5% return? Every installation must make its own decision, but the answer is clear.

"Although there may be some political benefit to being able to inform senior management that the instructions to squeeze more out of the system are being followed, the use of a cost-return ratio might demonstrate that the actual value of the effort is questionable."

tained at the expense of some other area. On a net basis, the difficulty or inconvenience experienced in one area may be more than offset by the gains produced in another area.

If the issue of fine-tuning the hardware resource is appropriately addressed, a considerable portion of the total gain to be realized can be obtained early with a rather limited effort. Given the proper advanced planning and analysis, 20% of the total effort can produce 80% of the total return.

potential results are going to be questionable in terms of the return on that effort.

Although there may be some political benefit to being able to inform senior management that the instructions to squeeze more out of the system are being followed, the use of a cost-return ratio might demonstrate that the actual value of the effort is questionable.

If such fine-tuning impedes or reduces a particular department's productivity, the value of any gains real-

Murray is director of management and information services for American Breeders Service, a DiviForrest, Pitts, division of W. R. Grace & Co. and is the author of Management Information Systems as a Corporate Resource.

Apprenticeship in DP shops guarantees high quality



READER'S PLATFORM

By Sanden

A certain basic structure is taken for granted in most DP organizations: On the one hand, there are managers who are not really supposed to be involved in technical matters other than to receive reports and so on from the technical staff.

There may be reports of technical solutions as well as progress reports, but the manager is not expected to solve technical problems, only to understand the issues when they are presented. The manager works with

administrative tools such as assignment of people, adjustments of plans, budgets and so on.

The technical staff, on the other hand, is supposed to concentrate on the pure technical issues and not to manage. Sometimes, a deal career is implemented whereby technicians can be promoted to technical positions on a par with management positions but notably as system experts. This normally implies a high degree of specialization in particular systems or techniques.

The type of organization where this occurs is probably based on traditional manufacturing where the main objective is to control large-scale production that is not very com-

plicated. The main issue is to manage large groups of people, to motivate them and to produce a certain output.

By contrast, I like to see the approach in the time-honored tradition of creative crafts, which is very appropriate because there is always an important creative element in software design.

The traditional organization in these trades is based on masters and apprentices, often with certain steps in between. The master is the manager but also the technical authority and the instructor.

Unlike that of a technical expert, the important characteristic of the master is not in-depth knowledge of a given system. That sort of necessary

expertise can be delegated. Rather, it is general design experience and acquired skill, which are more generally applicable.

There are several advantages with this approach: First, it is highly motivating. By the young apprentice with a technical interest, rather than administrative ambitions, the master is a professional guide as well as a role model. To the senior technician, it is a way to continue working with the technique while eschewing the boring details.

Over the years, the distance to the actual development terminal increases as does the distance to the program code. This prevents burnout. The master is not a chief programmer but is in charge of delegating the details.

Second, it guarantees quality. The master can assume the responsibility for the conceptual integrity of the large system. The approach economizes the scarce resource of senior technical talent. Just as important, it makes quality a central issue.

Today, quality is often the concern of management, department rather than of the line or project organization. As the technician sees it, quality is rewarded with prizes and pat on the back, and promotion is based on completely different criteria. The career of the master, however, is built solely on professional skill.

Communicate and clarify questions

An integral part of this skill is the ability to communicate and clarify technical questions. The existence of a master promotes the discussion of technical issues within the development group.

Contrary to the common belief that programmers are loners who prefer not to share a solution with anyone until it is finally coded, in actuality even the most reticent programmers love to discuss technical problems.

The real reason why technical problems are not discussed is that no body wants to listen. Colleagues are busy with their own problems, and the administrative manager is neither competent nor interested. The true master, however, will welcome the opportunity to provide guidance, mildly enforce relevant standards or concepts or simply tackle an interesting problem.

Another advantage is that technicians will receive competent feedback. However well intentioned, the administrative manager will base judgment on the words of others or on the compliance with plans and may easily overestimate a mediocre job in a critical project. At the same time, the manager may let an outstanding effort in a smoothly running project go unnoticed, simply because the work is so well done that the project never becomes critical and, therefore, never draws attention to itself.

The master, on the other hand, would hopefully be independent enough to judge each task on its own merits and be able to distinguish the difficult ones from the easy ones.

Continued on page 22

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Sanden is in charge of a distributed systems project at Philips Data Systems in Monterrey, Mexico.

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VIEWPOINT



LETTERS

Microprocessor comparison misleading with Mips figures

The article, "Chip vendor representatives wield claims at NCC session" [CW, July 29], in which technically well-qualified panelists at a technical session representing four major microprocessor manufacturers described and compared their products, is incomplete in a way that makes it seriously misleading.

The reader finishes it believing that the panelists presented their microprocessors mainly in terms of mi-

lion instructions per second (Mips), a simplistic, would-be measure of processing power, and made emphatic — if not belligerent — claims of superiority based on it.

In fact, the panelists, all of whom were apparently involved in the design of their products, spent by far the greater portion of their time on the technical features of their CPU's and the associated coprocessors and instruction sets.

The article's audience needs timely information about advances in the art of microprocessor design and about how those designs are evaluated. Information regarding the inadequacy of widely touted Mips figures, particularly when designers themselves publicly de-emphasize Mips evaluations, deserves to be noted.

William J. Clever
Chicago

Two-vendor shop provides no guaranteed solution

The article, "Choosing and using consultants" [CW, Sept. 2] was amusing and sad. It stated that an IBM representative decided that a particular shop needed to become a two-vendor shop. I cannot think of a single problem that is solved just by becoming a two-vendor shop.

The sad part is that a company would hire someone from IBM to come into a non-IBM shop to make recommendations. Do they really believe the representative is not going to recommend changing to IBM hardware? That is like going to a Ford dealer to help you choose between a Ford and a Chevrolet.

Bruce Powell
Port Arthur, Texas

From page 18

DP apprenticeships guarantee high quality

All these requirements of the master may seem like a large order, and obviously, the master's tasks are not easy ones. Masters are not just any people who have been around for a while. They must certainly have a genuine technical interest and an urge to continue developing techniques.

Given that, the other qualities can be acquired. There is a very natural path leading from the handwritten design of small programs to bigger programs to the design of large systems by means of specifications or other abstract tools, with the details delegated to others.

The ability to communicate technical issues develops in parallel, beginning with the reviews or presentations of one's first programs, if supported by the organizational culture. Finally, a growing interest in working with other people in delegating tasks is part of human maturation.

The master-apprentice organization does have a certain patronizing character, and one might think that this would be resented by apprentices. My experience, however, is that it will not, because of the technical authority of the master as well as the difference in work experience that will normally exist. People with a technical interest will respect a person who can provide concrete advice and suggest viable solutions to technical problems.

A different situation often exists today. Because of the rapid technological changes, many technicians who are fresh from school suddenly find themselves supreme authorities of some part of the technology, especially in small organizations where nobody has had the time to master the latest novelties. This may be challenging to a highly talented individual, flattering perhaps to others, but in general, it is not very healthy.

Investing devices to cope

The young individuals will have to invent their own devices to cope with the technique. There will be no role model, and the only nonadministrative career presenting itself is extreme specialization in the particular technique, which may not always be a very attractive prospect.

Masters exist in many places. Perhaps we do not hear very much about them simply because good results are produced without much ado. Also, perhaps masters can themselves be fortunate having talented and experienced individuals in the organization and do not realize that mastership can be cultivated. There is no lack of potential masters and young talent in need only of the right kind of support and guidance.

Maybe masters are particularly common in the academic world, which probably attracts more technically oriented and less career-oriented individuals than industry. Probably the existing management philosophy of industry hinders the development of masters. It may, however, be necessary to change the paradigms and recognize software development as a creative craft, not only to improve dramatically the general quality of software but also to create a more motivating environment and thus solve the problems of excessive manpower turnover.

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NEWS

Employment figures reflect trend toward efficiency

By Clinton Wilder

Employment levels of most major mainframe and minicomputer vendors declined or grew only modestly in the first half of 1985, reflecting both this year's in-

dustry slump and a trend toward more efficient manufacturing.

The worldwide work force at Control Data Corp. is at its lowest level in nearly eight years, having shrunk by

3,720 positions since Jan. 1 and by more than 10,000 jobs since 1981. Burroughs Corp. has been the year's other big job loser among the Bunch companies, with more than 2,000 employees laid off, chiefly in administration and production, in accordance with Chairman W. Michael Blumenthal's long-term consolidation plan.

At financially troubled CDC, the sale of subsidiary Magnetic Peripherals, Inc. production facilities in Minnesota, Texas and Kentucky slashed 900 positions, the largest single component of a domestic work force reduction of 3,400 since Jan. 1. CDC's worldwide employee population of 50,400 as of June 30 was its lowest since the end of 1977. Most of the cuts have taken place in production jobs, and CDC is not adding employees in other areas, according to spokeswoman Susan Bush.

IBM work force

At the other end of the spectrum, the work force continues to grow normally at IBM, the world's second largest industrial employer behind General Motors Corp. With 402,000 employees worldwide as of June 30, Big Blue grew by 7,000 employees in the first two quarters, consistent with its annual employee growth rate of 10,000 to 15,000 during the last several years.

The U.S. work force increased by 3,000 employees in the period, also a normal IBM growth rate, for a total of 242,000. "Hiring is proceeding across the board," spokeswoman Maxine Yease said. "Even though our profits have been lower than in past years, that hasn't connected to our employment figures."

The profit margins of Digital Equipment Corp. have also held up reasonably well during the current slump, but DEC has slowed its domestic hiring to a trickle and has reduced its manufacturing force. The U.S. work force expanded by 5,600 in the final nine months of 1984 but remained level at Jan. 1 and July 1 of this year.

Like Burroughs, DEC is in the midst of a long-term job reduction plan, but DEC's plan focuses specifically on the production area. Planning for smaller machines and more efficient, automated production lines, DEC has trimmed 3,000 manufacturing positions since the beginning of 1984. Another 2,000 cuts are planned in the next one to two years to reduce production employment to 25,000 worldwide from a high of 30,000 two years ago.

As our computers get smaller and more powerful, they need fewer people to

build them," said DEC spokesman Jeff Gibson. "Fewer materials mean fewer people to move the materials and fewer people to schedule them. When someone leaves the company in production, we're often re-employing the process instead of filling the position."

The same type of elimination by attrition has hit large vendors' middle management jobs in the current downturn, according to one leading executive headhunter. "The middle management ranks have been severely hurt in

this retrenchment, and I think those jobs are gone forever," said William Tholke, managing partner of Karen Ferry, an executive search firm in Palo Alto, Calif. "Companies have identified a lot of duplication and are finding they can do without many of these positions."

Employment levels in so-called revenue-generating positions — direct sales, service and support, for example — have generally been spared the layoff axe. "But

Continued on page 26

Employment levels

	Jan. 1	June 30	Change
Burroughs Corp.	U.S. World	Not available 65,300	63,000* -3.5
Digital General Corp.	U.S. World	13,030 17,800	11,875 -8.8
Hewlett-Packard Co.	U.S. World	56,000 82,000	57,000* +1.1
IBM	U.S. World	238,000 395,000	242,000 +1.2
Motorola, Inc.	U.S. World	7,470	8,100* +8.1
Sperry Corp.	U.S. World	27,900 36,900	27,800 -0.3

Most employment levels declined or grew only modestly.

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Ada gets Nasa nod for space station use

By Mitch Botts

Ada, the programming language of choice with the U.S. military, recently gained another convert. The National Aeronautics and Space Administration will use Ada in the first flight systems of the manned space station project scheduled for launch in 1992.

Nasa is the first nonmilitary U.S. agency to use Ada, the high-order language developed for the U.S. Department of Defense, according to U.S. Air Force Maj. Allan H. Kopp, a deputy director of the Pentagon's Ada Joint Program Office, which monitors Ada developments.

The advanced language may also be used in the operating systems and applications of an advanced air traffic control project that is being designed for the Federal Aviation Administration (FAA), Computerworld has learned.

Nasa's Space Station Project Office at the Johnson Space Center in Houston selected Ada as the language for flight subsystem applications programs on the space station. Furthermore, officials said Ada is a candidate for the space station's ground control computers as well.

Liana Burke, a software manager at the Johnson Space Center, said Ada was selected because it is the most robust and advanced language, because Ada compilers have been developed in the private sector, and because the Pentagon's support for Ada "gives us a degree of confidence in its long-term viability."

Commenting on the selection, Kopp said, "I think it clearly indicates that Ada is moving outside the realm of the Department of Defense into other government applications."

Kopp added that the Nasa action will have "ripple effects" on the computer industry. "It will mean that contractors doing business with Nasa will have to know Ada. It will mean the vendors who support those contractors with computer hardware and software will have to have Ada capability," he said.

Meanwhile, the Ada programming language is a leading candidate for use in advanced air traffic control soft-

ware at the FAA, according to government and industry sources.

The firms competing for the FAA's Advanced Automation System contract, IBM and Hughes Aircraft Co., are both using Ada design tools in the early stages of the design process, a well-placed government source confirmed. Moreover, Ada is a strong candidate for use in the actual operating systems and applications software, if a mature compiler and trained personnel can be found to implement it, the source added.

In addition to Ada's reputation for modularity and low-cost maintenance, Ada makes a good choice for the FAA because of its error-free code and high reliability—important features for collision-avoidance systems, government and industry sources said.

Last year, the government awarded contracts totaling \$246.7 million to IBM and Hughes for a three-year competition to design the advanced air traffic control system [CW, Sept. 3, 1984]. The contractor with the best design will get the production contract, with delivery beginning in 1989.

Ada already is the standard language for critical military computers at the DOD. The North Atlantic Treaty Organization recently announced it will implement the Ada language in all military systems, beginning in January 1986, according to Maj. Kenneth Schoenover, Ada project officer for the Air Force Systems Command, who spoke at the recent Federal Computer Conference in Washington, D.C.

However, the U.S. Postal Service (USPS), which last year planned to use Ada software for mail-sorting equipment at two bulk mail centers [CW, Aug. 20, 1984], ultimately did not use Ada.

According to Frank A. Amoroso, a USPS program engineer, those plans went awry when contractors, claiming that adequate Ada hardware and software were not available in time, substituted software products operating under AT&T's Unix system, which uses the C language.

From page 24

Employment figures show efficiency trend

that has been curtailed—we're hiring, but it's not wide open," DEC's Givton said.

Overall, DEC added 400 employees between Jan. 1 and July 1, all of them overseas, for a worldwide employment total of 89,000. The U.S. work force remained relatively stable, falling by 300 for a total of 59,300.

More than two-thirds of Prime Computer, Inc.'s 5% work force increased since Jan. 1 has been in sales and research and development positions. The Natick, Mass., minicomputer maker expanded by 680 jobs for worldwide employment of 8,100 as of Aug. 25.

Hewlett-Packard Co. has seen increases of 1,000 domestic and 2,000 overseas employees in 1985, with no particular concentration in specific job functions.

Two Bunch mainframe companies, Sperry Corp. and Honeywell, Inc., have experienced a modest decrease in employment since the beginning of the year. Honeywell's worldwide job total fell by 660 positions to 83,621 as of June 30.

At Sperry Corp.'s Information Systems Group, a slight increase in domestic employees in the first seven months of 1985 offset most of the loss of 600 laid-off production employees at the Sperry terminal and communications equipment facility in Salt Lake City, for a total of 36,800 employees worldwide and 27,800 in the U.S. as of July 31.

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Martin urges MIS managers to automate operations

By Charles Babcock

NEW YORK — Management information systems managers need to put more automation into their operations with engineering-style techniques, according to James Martin, the noted author and commentator on information management.

In a recent address to Cadmus Applied Data Research, Inc.'s users group, Martin described how information engineering will bring about a leaner, more end-user-driven corporation in the 1990s.

Martin said the modern corporation will be structured as a knowledge base composed of all data and rules pertaining to the business. The chief resource of the knowledge base will be an encyclopedia in which integrated models of data, the

putters like the IBM Personal Computer AT allow much more precise diagramming and give software developers a tool that yields a much quicker development time than a prototype, he noted.

Building a prototype early in the application development process would yield greater productivity, according to Martin. "I have never

seen an example of a prototype being given to end users without end users changing it. So if you build a system without a prototype, you are probably going to build it wrong," he said.

Martin urged his listeners not to underestimate the role that artificial intelligence will play. AI is no "genie coming out of the bottle," he

said, but its ability to apply a set of rules to a large body of data will make it a valuable component of the firm of the future.

That cannot happen while

AI is the subject of a kind of cult following that needs specialized computers to run its programs, according to Martin. "You want to lift it out of its subculture and anchor it

in the world of IBM and MIS," he said.

Information engineering, he concluded, will push MIS away from manual techniques and toward automated techniques. "This makes so much sense that every efficient corporation will do this," by the 1990s, despite massive migration problems, he said.

"
*The modern
firm will be
structured on a
knowledge base
composed of all
data and rules
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enterprise and the processes that run it are stored and cross-referenced.

The emerging techniques of artificial intelligence, when applied to the knowledge base, will be able to correlate the data, analyze and use the rules in many stages of decision making, he said.

To get to this point, however, MIS managers will need to use more disciplined techniques that lend themselves to manipulation by computer logic. Many MIS professionals worry that automation in their field could jeopardize their careers, but they should not, Martin noted.

"It's much more fun to work with power tools than hand tools," he said.

To move toward automation, MIS managers must minimize some current careless practices, such as incorporating the imprecise communications of English language specifications into program designs.

Most of Martin's talk addressed diagrammatic program specifications, a topic that has occupied his recent attention and is the subject of a forthcoming book.

"Diagrams have got to have the precision of a computer language. They are a computer language," he maintained. Precision diagrams will allow automated conversion of data flow diagrams into data navigation diagrams, decomposition diagrams and more, he said.

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IBM's Opel calls for competition in foreign telecom nets

By Jeffrey Beeler

SAN FRANCISCO — IBM Chairman John Opel last week called for foreign governments to open telecommunications networks to the free-markets dynamics that have fueled advances in the U.S. information processing industry.

"Competition must increasingly govern . . . an in-

dustry segment with which information processing is converging — telecommunications," Opel said during the eighth quadrennial International Industrial Conference.

"Historically the telecommunications networks of the world have existed under noncompetitive arrangements — as franchised mo-

nopolies owned or tightly regulated by government," Opel said during the conference luncheon address.

Within the last few years, however, governments have begun to retreat somewhat from their traditional monopolies and to push their telecommunications industries steadily toward deregulation. The process is already

nearly complete in the U.S. and appears to be gathering momentum in several other countries as well.

"Britain has liberalized its policy," Opel told some 500 conference audience members representing more than 60 nations. "We have Canada and, to some extent, Ireland. Japan has passed legislation ending its tradi-

tional monopoly system with the intention of opening the telecommunications market to competition. Other countries are actively debating similar changes."

The worldwide movement toward deregulated telecommunications promises to yield significant benefits, Opel maintained. "Competition not only will continue to propel the growth of information processing," he said, "it also will power new growth in telecommunications. And it will bring both industry segments together



IBM Chairman John Opel called for worldwide deregulation of telecommunications.

in a flourishing \$2 trillion marketplace before this century ends."

In information processing, free enterprise has already fostered dramatic price/performance improvements and has otherwise fueled breathtaking technological advances, Opel said.

To underscore his point, he contrasted the recent histories of the information processing and telecommunications sectors. Since 1968, the execution rates for general-purpose processors have grown by a factor of 938, while the associated costs have dropped by a factor of 234.

In the telecommunications field, by contrast, a Tokyo-to-San Francisco telephone call that cost \$17 in 1968 carries a \$7 price tag today. "That difference in performance [between the information processing and telecommunications industries] reflects the price exacted by regulation, which, among other things, inhibits the abandonment of obsolete equipment for new [equipment]," Opel said.

Competition in the information processing industry has also "made an anachronism of artificial national regulatory barriers," promoted the development of international standards and blurred the distinction between what should and should not be regulated, he said. Similar changes are expected to accompany the ongoing deregulation of telecommunications networks.

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U.S. representative assails nine-digit Zip code program

WASHINGTON, D.C. — U.S. Rep. Glenn English (D-Oaks), a critic of the U.S. Postal Service's (USPS) nine-digit Zip code program, recently said the USPS should place more reliance on new optical character recognition (OCR) and bar-code equipment for mail sorting.

English, chairing a Sept. 13 hearing by the U.S. House of Representatives Subcommittee on Government Information, Justice and Agriculture, told USPS officials, "The focus should be on automation" rather than on the Zip + 4 program to reduce mail-sorting costs at the quasi-governmental agency.

The USPS recently announced it will begin testing multiline OCR equipment that can read the entire address on an envelope and print a bar code on the lower part of the envelope. At the same time, the USPS announced it will increase the discount that business mailers get for using the nine-digit Zip code. [CW, Aug. 19.]

English said the new equipment will make Zip + 4 obsolete, but USPS representatives disagreed. "The move toward multiline readers does not in any way lessen our commitment to Zip + 4," testified Jerry K. Lee Sr., senior assistant postmaster general.

"Deployment of the multiline readers over the next several years

Joint venture to offer packet network service

SAN DIEGO — A gaggle of unlikely partners has joined forces with the intention offering a packet-switching service later this year, it was announced at the Telecommunications Association 1985 fall meeting week.

At the conference, MCI Communications Corp., Amdahl Corp., Pacific Bell, Security Pacific Data Transmission Corp. and Dow Jones News/Retrieval service demonstrated a service capability that may be ready as early as this winter.

While traditional packet-switching carriers such as GTE Telenet Communications Corp. and McDonnell Douglas Automation Co. supply users with end-to-end services, this joint effort will have different companies providing network link segments and components.

In the demonstration, Pacific Bell and Security Pacific provided local-exchange packet connections to Dow Jones over an MCI long-distance link. Amdahl provided the network management processors, network concentrators and other components needed to access the packet net.

The joint venture plans to build networks for private customers using local-exchange packet nets interconnected with packet links from MCI.

will enable the Postal Service to increase near-term automation-related savings while Zip + 4 volume continues to build," Lee said. "In the long run, the Zip + 4 code, coupled with multiline equipment, promises to provide the highest productivity gains for the Postal Service."

English said he has long urged the USPS to implement an automation program first, then consider a longer Zip code if that is cost effective. English claimed that the Zip + 4 program has been mismanaged and that further discounts to mailers are an unnecessary subsidy.

NBS announces development of data dictionary standard

GAITHERSBURG, Md. — The Na-

tional Bureau of Standards (NBS) recently announced that it will publish a standard for data dictionaries used in information systems of the U.S. government.

The announcement said the NBS will make the proposed ANSI standard on information resource dictionary systems a new Federal Information Processing Standard to promote portability of data among government users.

A preliminary cost-benefit analysis estimated that the U.S. government would be able to save more than \$120 million, in constant 1983 dollars, by the early 1990s by using a standard data dictionary, according to the NBS.

In addition, the NBS announcement reported that a set of automated validation tests is currently under development.

DOD encourages ATM banking at military bases

WASHINGTON, D.C. — The U.S. Department of Defense recently proposed new regulations that encourage banks and other private financial services to open facilities — including automated teller machines — at DOD bases for military personnel.

The proposal stated that, although branch offices of banks, savings and loan associations, and credit unions are preferred, ATM kiosks are permitted when full-scale financial services cannot be provided.

"In acquiring [ATM] services," DOD added, "preference shall be given to proposals that offer shared-access ATMs."

Public comments on the proposed rules are due Oct. 23.

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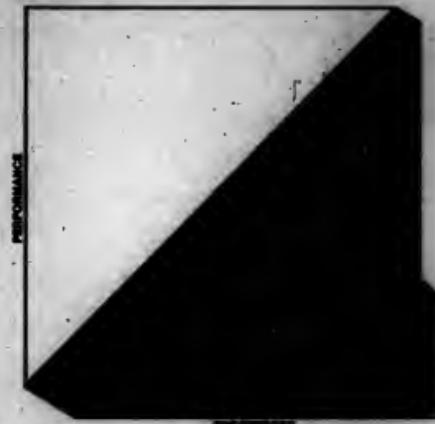
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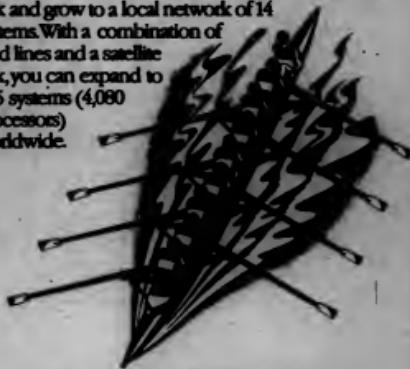
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 **TANDEM COMPUTERS**

NEWS

Federal historians alarmed at loss of computerized data

By Miles Botts

WASHINGTON, D.C. — Government historians and records managers, upset by the loss of computerized government data, vowed at a recent meeting to take a more aggressive role in shaping information management policy.

The meeting, hosted by the Society for History in the

Federal Government, featured complaints from records managers and archivists at federal agencies:

- Information systems are rarely designed with any input from records managers and archivists, who must retrieve historically important information 30 or more years after it is stored.

- Records managers in the

government are placed far below DP managers in the information management hierarchy and get little respect or resources.

- The U.S. Congress has given an alphabet soup list of agencies that have the authority to manage federal records, but strong policy direction is lacking.

- Generally, records manag-

ers and archivists need to retrieve and store certain types of government information, such as analytical reports, precedent-setting agency policies and directives, minutes of board meetings, legal opinions and comments on legislation.

According to a blue-ribbon panel called the Committee on the Records of Govern-

ment, the computerization of government records has caused several problems, including the deletion, caused by word processing software, of historically significant first drafts of policy documents.

Consequently, "the U.S. is in danger of losing its memory," the committee's recent report said. Because of storage of electronic records, future historians may know less about the 1986 arms control talks than about the 1973 Strategic Arms Limitation Talks, it said.

Furthermore, the growing use of electronic mail makes it less likely that important government memos will be preserved, the report said.

Frustrated with these problems, participants at the meeting said a government agency or committee is needed to set information policy. Anna Nelson, who was project director of the committee report, said a high-level records council is needed to coordinate policy along with the National Archives and Records Administration.



WORLD NEWS
CW International
News Network

 MANILA — As part of a sweeping effort to computerize government offices, the Philippine President Ferdinand Marcos has eliminated the country's \$60,000 ceiling on the importation of computer equipment, reduced tariffs on those products and established a cabinet subcommittee to review the status of computerization.

The subcommittee, headed by Prime Minister Cesar Virata, is responsible for formulating a plan to boost technological development in the Philippines. Acting as consultants to the committee are technical experts from the government and private sector. Key government ministries and agencies reportedly have been assigned to lead the automation project and will be the first to acquire equipment.

 VIENNA — Philips Data GmbH announced a microcomputer named Yes. Yes is equipped with an Intel Corp. 80186 processor, DOS-Plus operating system and 64K bytes of read-only memory from Digital Research, Inc. Production of Yes, which will take place in Austria, Philips said. For marketing and sales within Austria, Philips said it hopes to line up 100 distribution partners before the end of 1986.

“We can do the

rest,” he said.

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Finally, Honeywell gives the people in the trenches, the end-users, the friendly kinds of software that make the DPS 6 system easily accessible to everyone.

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Micro statistics tool helps General Foods track tastes

Cuts division's \$6,000 monthly CPU costs

WHITE PLAINS, N.Y. — You can't tell a book by its cover, and you can't judge a company by the design of its box. Nevertheless, said a spokesman for General Foods Corp., maker of the Post brand breakfast cereals, research shows that such factors as package shape or color can translate into millions of dollars of sales — lost or gained — for the company.

So it comes with appropriate thoroughness and care that the General Foods food division headquarters in this New York suburb went about selecting a microcomputer statistical-analysis package to help determine the likely effects of product packaging and other variables on consumers' buying decisions. The headquarters supports six food divisions, which make and market products such as Minute Rice, Maxwell House Coffee, Oscar Mayer bologna and Post Raisin Bran.

According to Stephen Hood, a group marketing information associate at General Foods, members of the company's data research department will survey hundreds — sometimes thousands — of consumers to gather information about their purchasing habits. General Foods researchers collect demographic data as well as information about test subjects' reactions to a product or a package design.

The data sets that contain information from the surveys are large, Hood said. "It would be typical to find someone looking at, say, 20 variables and 1,000 cases from the interview data."

Until recently, the market research group relied on mainframe software packages, mostly SAS Institute, Inc.'s SAS, to perform regression analyses and other statistical operations on the information that had been collected. To access the software, which runs on a 16M-byte IBM 3033 at General Foods' corporate headquarters in Rye Brook, N.Y., the group had to pay up to \$4,000 per month for CPU time.

"What was happening," Hood continued, "was that a number of people were coming in and saying, 'Well, gee, if I could download the data to a micro, it could substantially cut those costs.' "

Last summer, Hood, who is responsible for finding tools for market analysts to use in their work, obtained a copy of SPSS, an IBM Personal Computer XT. Since then, he and seven other micro users have been performing statistical analyses on micros using the SPSS package.

To access survey data, users dial into either the 3033 or one of 10 Prime Computer, Inc. 2200s General Foods maintains for data storage. They download the information to SPSS/PC using error-checking communication protocols in Tymshare, Barker & Sloane, Inc.'s Addata data base software. Portions of Addata run both on the 3033 and on the personal computers that run SPSS/PC.

For operations that the micro package does not support, such as discriminant analysis, and for analysis of data sets with more variables

than the micro package can handle, users still rely on mainframe software. Hood said applications involving both micro and mainframe analyses at different stages are common.

Since the micro software has been installed, however, analysts have used it for as many projects as possible, Hood said, because of the cost savings it represents.

Besides performing regression, variances and factor analysis procedures on market research data, the analysts use the software to examine consumer trends and warehouse figures on product turnover. They also use it to prepare data for procedures like graphics display that are available in other software packages.

Hood said most analysts learned to use SPSS/PC within a week because they had been exposed to SPSS mainframe software at college and had no problem understanding the micro version's documentation. The short learning cycle translated into lower costs and higher efficiency.

"We need a situation where we're

not going to have analysts spending a great deal of time learning a new program," he said. "This package lets them get into their analysis and use a variety of statistical procedures on their data right away and with relatively little help."

Hood said he expects about 100 employees at General Foods to use the micro statistical-analysis software eventually. The firm does not impose any top-down restrictions on microcomputer hardware and software. Users who can justify a purchase to their superiors are free to buy whatever they think will meet their needs. The company maintains an information center to guide users in their choices.

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6.1



CALENDAR

WEEK OF OCTOBER 20

OCTOBER 21-22, LOS ANGELES — Street Response Marketing for Financial Institutions. Telecommunications, News, Mail & Sales Training. Contact: Alice Gibson, Inter-Financial Association, 21 Tamai Vista Blvd., Costa Mesa, Calif. 92626.

OCTOBER 21-23, BOSTON — Seminar Series '89: Shaping the Future Revolution in End-User Computing. Contact: Robert L. Johnson and Co., 1000 Commonwealth Ave., Cambridge Center, Cambridge, Mass. 02142.

OCTOBER 21-23, SAN FRANCISCO — Learned on IBM. Contact: Reggi Vosch, National Marketing, Suite E-1A, Standard Court E, 9190 Red Branch Road, Columbia, Md. 21045. Also being held Oct. 26-31 in Dallas and Nov. 4-6 in Boston.

OCTOBER 21-23, WASHINGTON, D.C. — Controlling Software Project Management, Measurement and Estimation. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Dec. 9-11 in Dallas.

OCTOBER 21-24, CHICAGO — Systems & Applied Technology Conference (Satch '89). Contact: Satch '89, 2472 Eastman Ave., No. 24, Ventura, Calif. 93003.

OCTOBER 21-24, PITTSBURGH — Work Measurement Techniques Working Series. Contact: Institute of Industrial Engineers, Register, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

OCTOBER 21-25, BOSTON — Analysis Workshop. Contact: Judy Treloar, Arthur Young & Co., 1960 Roland Clarke Place, Boston, Va. 22001.

OCTOBER 21-25, CHICAGO — CICS Macro-Level Programming. Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W. 39th St., New York, N.Y. 10001.

OCTOBER 21-25, NEW YORK — Comprehensive Course in Data Communications. Contact: Data Communications, Special Projects Conference Management Center, c/o Information Breakthroughs, Inc., 445 W. Main St., Wyckoff, N.J. 07481. Also being held Nov. 18-22 in Lake Buena Vista, Fla.

OCTOBER 21-26, NEW YORK — Structured Systems Engineering Workshop. Contact: Steve Balaban, Learmonth & Burchart Management Systems, Inc., Suite 405, 2000 N. Loop West, Houston, Texas 77082.

OCTOBER 21-25, WASHINGTON, D.C. — Ada Software Engineering Workshop. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Oct. 23 to Nov. 1 in Los Angeles.

OCTOBER 22-23, BOSTON — Developing End-of-Arm Tooling for Industrial Robots. Contact: Robotics International of the Society of Manufacturing Engineers (SME), P.O. Box 980, One SME Drive, Dearborn, Mich. 48121.

OCTOBER 22-25, DENVER — Data Bases A Builder's Guide. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also set for Nov. 12-15 in Dallas and Dec. 3-6 in Washington, D.C.

OCTOBER 22-25, SAN FRANCISCO — Worldwide '89 — World Communications and Computer '89. 3800 Conference and Exhibit. Contact: International Council for Planning and Innovation, P.O. Box 17802, Washington, D.C. 20041.

OCTOBER 22-25, SAN FRANCISCO — Fifth Multinational Conference on World Communications and Computer. Contact: International Council for Planning, P.O. Box 17802, Washington, D.C. 20041.

OCTOBER 22-25, NEW YORK — Strategies for Office Automation. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held March 11-15 in Boston.

OCTOBER 24, NEW YORK — IBM/VME for Systems Programmers. Contact: Sys-Ed, Computer Education Techniques, Inc., 35 W.

56th St., New York, N.Y. 10001.

OCTOBER 24-25, LOS ANGELES — Local Area Network Management and Internetworking. Contact: Software Institute of America, Inc., 8 Wheeler St., Andover, Mass. 01810.

OCTOBER 24-25, SAN FRANCISCO — Learned — The IBM PC. Contact: Reggi Vosch, National Marketing, Suite E-1A, Standard Court E, 9190 Red Branch Road, Columbia, Md. 21045. Also being held Nov. 7-8 in Boston.

OCTOBER 24-25, SAN FRANCISCO — PC as a Programmer/Analyst Workstation. Contact: Software Institute of America, Inc., 8 Wheeler St., Andover, Mass. 01810. Also being held Nov. 21-23 in Washington, D.C. and Dec. 12-13 in Boston.

OCTOBER 25-27, FRANKFURT — The Perth Medication Laboratory Conference. Contact: Perth In-

terest Group, P.O. Box 8231, San Jose, Calif. 95156.

WEEK OF OCTOBER 27

OCTOBER 26-27, HOUSTON — Issues '89: The Information Systems Education Conference. Contact: Issues '89, Data Processing Management Association, 505 Busey Highway, Park Ridge, IL 60068.

OCTOBER 27-30, CHICAGO — International Facility Management Association 1989. Contact: Melvin E. Schiltz, Executive Director, International Facility Management Association, Suite 1410, 11 Grosvenor Place, Houston, Texas 77046.

OCTOBER 27-30, ZURICH — Europe's New Challenges: Emerging Business Opportunities Related to

Continued on page 44

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—ComputerWorld

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—Popular Computing

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—Computers and Electronics

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NEWS

From page 41

Calendar

Gas and the III-V Technologies. Contact: Robert F. Dick, Horizon Associates, 2255-G Martin Ave., Santa Clara, Calif. 95050.

OCTOBER 28-29, DALLAS — The Computer Acquisition Forum. Contact: Ashley Pearce, Gartner Group, Inc., P.O. Box 10212, Stamford, Conn. 06904.

OCTOBER 28-29, SAN FRANCISCO — Payment Systems Partnership II. Contact: Alice Gibson, International Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925.

OCTOBER 28-30, BOSTON — X36 and Other Preconferences. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 28-30, COLUMBUS,

OHIO — C Programming Language. Contact: Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

OCTOBER 28-30, HOUSTON — The 34th Annual Data Processing Management Exposition (DPMA) International Computer Conference and Business Exposition — DPMA Houston '85. Contact: Doris Dodge, Conference Meetings Manager, DPMA International Headquarters, 500 George Highway, Park Ridge, Ill. 60068.

OCTOBER 28-30, NEW YORK — Cellular Communications '85. Contact: Online Conferences, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

OCTOBER 28-30, NEW YORK — Linelinet '85. Contact: Online Conferences, Inc., 989 Avenue of the Americas, New York, N.Y. 10018.

OCTOBER 28-30, NEW YORK —

OCTOBER 28-30, WASHINGTON, D.C. — Local Area Networks. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 28-NOVEMBER 1, BOSTON — CICS/VB Command-Level Programming Course. Contact: Computer Assistance Product Development Corp., Suite 108, 11498 Lure Road, Dallas, Texas 75234.

OCTOBER 28-NOVEMBER 1, BOSTON — Information Programming Workshops. Contact: Judy Trilegan, Arthur Young & Co., 1960 Roland Clarke Place, Boston, Va. 23061.

OCTOBER 28-NOVEMBER 1, NEW YORK — Database Development Workshop. Contact: Elise Rabais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop West, Houston, Texas 77092.

OCTOBER 28-NOVEMBER 1, TORONTO — The James Martin Seminar. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402. Also being held Nov. 18-22 in Atlanta.

OCTOBER 28-31, WASHINGTON, D.C. — The Sixth Annual Federal Office Automation Conference. Contact: Dallas Kinney, Conference Communications, Box N, Wayland, Mass. 01778.

OCTOBER 30-NOVEMBER 1, NEW YORK — ANTO 1985 — Federal ADP and Telecommunications Preconference. Contact: International Data Corp., Washington Division, Suite 240, 1500 Planning Research Drive, McLean, Va. 22102. Also being held Nov. 14-15 in McLean.

WEEK OF NOVEMBER 3

NOVEMBER 4-6, BOULDER, COLORADO — International Tele/Conferencing Symposium. Contact: Tom Cross, Cross Information Co., Suite C, 854 Pearl St., Boulder, Colo. 80302.

NOVEMBER 4-6, WASHINGTON, D.C. — Data Dictionaries: Concepts, Contents and Uses. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

NOVEMBER 5-8, BELLEVUE, WASH. — Hands-On Unix for Programmers. Contact: Specialized Systems Consultants, Box 56549, Seattle, Wash. 98155.

NOVEMBER 7-8, NEW YORK — Videocon: Delivery of Financial Services On-Line Banking, Electronic Brokerage and Transactional Services. Contact: Alice Gibson, Inter-Financial Association, 21 Tamal Vista Blvd., Corte Madera, Calif. 94925. Also being held November 14-15 in San Francisco.

NOVEMBER 7-8, WASHINGTON, D.C. — Data Administration: Development and Practice. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

NOVEMBER 9, NEW YORK — Computer Education in Transition, B.A.S.I.C.(s) and Beyond. Contact: Association of Computer Educators, 761 Bard Ave., Staten Island, N.Y. 10316.

WEEK OF NOVEMBER 10

NOVEMBER 10-15, BALTIMORE — The Ninth Annual Symposium on Computer Applications in Medical Care (SCAMC). Contact: Gail Nutnik, Symposium Coordinator, SCAMC, Secretariat: Office of Continuing Medical Education, George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

NOVEMBER 11-15, WASHINGTON, D.C. — The Conference on Software Maintenance-1985 (CSM-85). Contact: Daniel A. Parker, CSM-85 Publicity Chairman, National Aeronautics and Space Administration, Goddard Space Flight Center, Code 850.1, Greenbelt, Md. 20771.

NOVEMBER 11-15, SAN JOSE, CALIF. — First International Conference on Computer Workstations. Contact: International Electrical and Electronic Engineers, Inc., Computer Society, 10662 Los Vaqueros Circle, Los Alamitos, Calif. 90720.

NOVEMBER 12-15, NEW YORK — T-1 Carrier Strategies. Contact: DMW Group, Inc., Seminar Division, 2020 Hogback Road, Ann Arbor, Mich. 48104.

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UK users moving to MVS

Security called catalyst for migration from DOS

By John Greenman

BUCKINGHAM, England — DP auditors in the UK who are demanding improved data access security are helping to drive conversions from IBM's widely installed DOS/VSE to its strategic MVS operating system.

That is according to Michael Kerford-Byrnes, principal of MKB Technical Services, a consulting firm that specializes in DOS-to-MVS conversions.

"Here, internal and external auditors who come to computer installations actually have some teeth, and because they have a bit of computer knowledge, they know

where to bite," Kerford-Byrnes said in a telephone interview from England.

"A lot of users are running out of steam with DOS" and they need [Extended Architecture (XA)]. They need it for capacity, for function, and they desperately need it for security," he continued. "The general attitude over here is rapidly becoming if you're going to have any sort of access control, it's got to be RACF or something like it," he said, referring to IBM's Resource Access Control Facility MVS security control program.

Thus, he said, more and more users in Europe are being attracted to MVS for a reason other than the need for increased functionality and capacity. Rather, the demand for better data security is becoming a chief motivation to convert.

Continued on page 55

Notes from the software industry front

Sunnyvale, Calif.-based Data Design Associates, Inc. and Applied Data Research, Inc. (ADR) of Princeton, N.J., announced a development and marketing agreement through which Data Design's four mainframe financial applications will work with ADR's Datacom/DB relational data base management system. Data Design's accounts payable, general ledger, fixed assets and capital project management tools will be compatible with Datacom/DB.

Mitrol, Inc. of Woburn, Mass., has purchased worldwide exclusive distribution, marketing and maintenance rights to Rockville, Md.-based General Electric Information Services Co.'s (Geisco) Mine manufacturing applications development system. Mitrol said it will market Mine in North and South America. Through Geisco's partnership with Teacore of Norway, Teacore will

Continued on page 51

DOS micros get IBM link

Multi Soft, Inc. of Edison, N.J., has announced Super-Link, a micro-mainframe link package for data transfer between IBM's PC-DOS or Microsoft Corp.'s MS-DOS operating systems and IBM mainframes.

Super-Link includes a microcomputer control program, a library of mainframe subroutines and a microcomputer screen management program.

Super-Link will support IBM mainframes running VM/CMS, TSO or CICS and others running PC-DOS, MS-DOS and SI, a microcomputer operating system developed by Multi Soft. SI is available for several Motorola, Inc. 68010 microprocessor-based micros.

The micro-mainframe product provides links to applications running on the mainframe, rather than direct links into data base management systems. The VM/CMS version is available now, and the CICS and TSO versions are scheduled to be available by the end of October. Super-Link is priced from \$10,000 to \$60,000 depending on the hardware and number of micros.



Cobol 85 plods to acceptance

There's a good chance the belated Cobol 85 standard will finally cross the international and American finish lines before the end of this year.

Industry's not overly surprised if the standardization process drags into the new year and what could have been Cobol 85 becomes instead Cobol 86. The controversial — to say the least — Cobol 85 standard has demonstrated a real knack for discovering stumbling blocks as it plods along toward International Standards Organization (ISO) and American National Standards Institute (AnsI) approval.

Whether the proposed standard will find yet another such obstacle before January is anybody's guess.

The proposed Cobol standard was known for years as Cobol 80 and was initially envisioned as a routine overhaul of the existing Cobol 74 standard. But Cobol 80 was just not to be. Cobol 85's official label, EX, replaced the 80 as a sign of just how uncertain the final date of approval would be. If the standard does indeed become known as Cobol 86, it will represent the first internationalized upgrade of the most widely used programming language in 11 years. That's simply too

though a programming language like Cobol may seem dry and uninteresting to the uninitiated, it is a language that, like any other, must evolve over time if it is to survive. As with English, programming languages have to change to accommodate new ideas and new approaches.

Changes to spoken languages are subtle and reflect shifts in attitudes

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■ Major licensees of Pick Systems' Pick operating system have banded together to draft applications portability standards./48

■ Control Data introduced a service designed to help its Cyber 180 users manage their DP resources./48

■ Whitesmiths made its Iris operating system available for Hewlett-Packard's Series 200 technical workstations./48

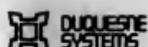
■ Interactive Software Systems unveiled Panelpro, an IBM CICS applications development tool./48

INSIDE

Systems
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SOFTWARE & SERVICES

Harris offers engineering tools

Modules include design, drafting

Harris Corp. has introduced Harris Civilcad software, with design, drafting and data management capabilities for civil engineering and construction applications.

The software runs on all H series superminicomputers from the Fort Lauderdale, Fla.-based company. Civilcad includes seven modules: Digital Terrain Modeling, Cogo,

Hydro, Bill of Materials, Earthwork, Roadway Profile Design System and Civilcad Drafting.

Each module can be purchased separately or in combination. On the entry-level Harris 60, up to 48 users can work with the Civilcad software modules for concurrent handling of various tasks. Harris processors can host Harris microcomputers or any IBM-compatible microcomputers as workstations or terminals.

A turnkey Civilcad system with hardware, software and

peripheral equipment for a four-user civil engineering environment costs \$194,000.

The system includes a Harris 60 superminicomputer, a 47482-byte disk drive, a streaming tape drive, a floating-point processor, a matrix printer, four graphics terminals, four digitizing tablets, a plotter and Harris Drafting, Cogo and Digital Terrain Modeling software modules.

The price for all seven modules in the Civilcad package is \$65,000. The packages are available now.

CDC provides consulting service

Control Data Corp., based in Minneapolis, has announced a consulting service to help Cyber 180 series computer users running the NOS or NOC/VSE operating systems manage present and future computer resources.

The Capacity Management and Performance Analysis Services consists of two component services, Vital Signs and Work Load Analysis.

The Vital Signs service provides software said to monitor and analyze system use, establish a base line, recommend system tuning alternatives and monitor system performance.

In addition, a report prepared every quar-

ter provides a summary of resource usage, system dynamics, system overhead and resource overlap and recommends ways to improve system performance and throughput, a spokesman said.

The Work Load Analysis service predicts future load levels and generates configuration alternatives to process the predicted work load, which is based on customer forecasts of applications growth, according to the vendor.

Prices range between \$14,000 and \$22,000 per year for Vital Signs; Work Load Analysis costs between \$14,000 and \$30,000 per year, CDC said.

Operating system out for HP Series 200

Whitesmiths, Ltd. of Concord, Mass., has announced that its Idris operating system is now available for Hewlett-Packard Co.'s Series 200 technical workstations

running on the HP 9000 minicomputer.

Idris is a real-time, multitasking, multitasking operating system created by Whitesmiths for software

development. Idris was designed to run on small machines, such as the HP Series 200. The operating system is said to provide a real-time environment for applications compatible with AT&T's Unix.

The product is managed by a hybrid scheduler, which allows for both deterministic execution of real-time processes and reasonable response time for interactive time-sharing processes in a time-sharing system. Idris provides low-level file and device I/O services and interprocess communications using shared data, locks, events and messages as well as Unix-style "pipelines."

Device drivers are included in C source for floppy disk drives, hard disks, printers, serial I/O, terminals and integral CRTs and keyboards. Approximately 100 utilities are provided with Idris, including Whitesmiths' C and Pascal compilers as well as an assembler, linker, librarian and related object tools.

A variety of software tools for such functions as communicating with other systems, controlling multiuser login and security and sending and receiving mail are also included.

The single-unit price for Idris running on the HP Series 200 is \$3,500.

Pick users to set guides

LAS VEGAS (CW) — Major licensees of the Pick operating system have formed an association that will seek to establish basic standards designed to allow portability of user applications under the successive implementations of the operating system.

Representatives of 11 of the operating system licensees formed the association under the temporary chairmanship of Leonard Mackman, chief executive officer of General Automation, Inc., Anaheim, Calif. General Automation uses Pick as the operating environment for its GA Zora series of supermicrocomputers.

Two interim committees were also formed, a technical standards committee and a committee that will meet in October to formalize the association, elect officers and define its charter.

Dick Pick, the developer of the operating system, has also been invited to join the association through his company, Pick Systems, Inc. of Irvine, Calif.

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Panelpro boosts on-line applications development

Interactive Software Systems, Inc., of Chicago has announced Panelpro, a programming aid that allows Cobol programmers to develop on-line applications without knowledge of IBM's CICS.

Panelpro requires a programmer to enter only Cobol to develop command-level programs, a spokesman said. Panelpro programmers familiar to Cobol programmers such as Read/Write and Rewrite, which are used to reduce the need for CICS specialists.

Panelpro introduces the Procedure, Screen and Report verbs.

Screens are painted by preparing subsequent across lines, which range from one to 80,000 in number. Procedure programming starts with the procedure code, circumventing conventions commonly required in Cobol.

In other features, Panelpro offers forward and backward paging, creation of temporary data structures, during coding and automatic editing.

Panelpro works with IBM VMS file structures, eliminating the need to convert existing files when the system is installed. Panelpro is priced at \$15,000.

SCA introduces source-to-load tracking option

Software Corporation of America (SCA) has announced the Connection option for its Change Tracker mainframe software, which automatically tracks changes made to executable libraries. The product runs in IBM OS, MVS and MVS/XA environments.

A spokesman for the Herndon, Va.-based SCA said the Connection option provides source-to-load change tracking capabilities. The option captures and records information about source modules as it is translated and input to the compiler.

The information is carried forward through the compilation into the linked-edited load module. Used together, the Change Tracker and Connection options are said to eliminate manual efforts required to identify the source modules that comprise a load module.

The Change Tracker is integrated with the linkage editor and records each time a program is added or changed.

The Change Tracker is priced at \$6,500 for a single-CPU permanent license and \$8,000 for a site license. The Connection option, to be available in November, is priced at \$8,500 for a single-CPU permanent license and \$8,000 for a site license.

MProlog out for Lisp system

Logicware, Inc. of Toronto, Ontario, has announced that its MProlog language is available for the Symbolics, Inc. 3600 Lisp-based computer.

Previously available on a variety of machines, MProlog reportedly now allows artificial intelligence applications written in Prolog to run under Lisp.

According to the vendor, MProlog allows users to develop programs on a Lisp Symbolics 3600 machine and move those programs to a Motorola, Inc. MC 68000-based system. MProlog on the Symbolics 3600 costs \$12,000.

Software said to translate PDP-11 programs to VAX

Virtual Systems, Inc. of Walnut Creek, Calif., has announced a program, Macrovox, that translates assembly language software written for Digital Equipment Corp. PDP-11 systems into VAX assembly language programs.

Originally written to translate the company's own library of PDP-11 source programs into VAX native-mode assembly language, Macrovox is now commercially available, according to the vendor.

Running on either the PDP-11 or VAX system, Macrovox can translate 98% of the PDP-11 assembly lan-

guage programs with minimum programmer effort, a spokesman said. Assembly language directives and control statements are translated in such a way as to ensure optimum performance on a VAX.

Macrovox automatically segregates PDP-11 programs into code and data areas, and models the PDP-11 stack in the data area. Programs may be of any size, but data is limited to a 64K-byte area.

The Macrovox program is priced at \$10,000 per CPU. The system includes manuals and a one-week training session.

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CG

SOFTWARE & SERVICES

SYSTEMS SOFTWARE

8 Key Solutions, Inc. has announced Version 1.3 of the Missing Commands data inquiry and maintenance package, offering display or update of any IBM System/36 file in hexagonal, character or formatted mode.

According to a spokesman, the Missing Commands package can be used to display and update any System/36 file one record at a time or one full page at a time.

In other added features, Missing Commands has an additional screen to display a full page of records, showing only the data from fields specified by the user, and a feature to scan optionally by field name. The product also has a new facility for deleting records and a display to provide current file information.

The Missing Commands is priced at \$500. Current users can update to Version 1.3 for \$75 per copy.

Key Solutions, Inc., 111-G Shelley Ave., Campbell, Calif. 95008.

8 Advac, Inc. has announced the Project Implementation and Control System (Pics) for the IBM System/36.

Pics is designed to monitor programs that are frequently updated and altered. The system supports multiple libraries and a variety of object management functions and ensures that production source and objects are synchronized and have been properly secured. It also ensures that new or changed objects have been successfully transferred to production, the vendor said.

Written in IBM's RPG-III, Pics is menu-driven and includes a management checkpoint feature that validates documentation and test requirements prior to job implementation.

Pics is priced at \$1,850. **Advac, Inc.**, 30 Mohamed Drive, Novitak, Mass. 01532.

APPLICATION PACKAGES

8 Pracelinc, Inc. has announced Hieroglyph, a report writing package for Sun Microsystems, Inc. workstations running AT&T's Unix.

Hieroglyph integrates text processing, graphics, document aids, document filing, data handling and production tools, a spokesman said.

The software offers concurrent application processing, multiple windows editing, computer-aided design graphics capabilities, the ability to embed graphics in text, the ability to scale graphics, support of laser printers, a spelling checker and three user-experience levels.

Hieroglyph sells for \$2,400. **Pracelinc, Inc.**, Suite 300, 680 Bay Ave., Capitola, Calif. 95010.

LANGUAGES

8 Pyramid Technology Corp. has announced optimizing Fortran 77, C and Pascal compilers for its Pyramid 98X, 98MX, 98X and 98XE processors.

The compilers work with Pyramid's Common Language Environment, a standardised high-level pro-

gram development and execution environment integrated with Pyramid's OS/2 operating system. The operating system is said to incorporate both the University of California at Berkeley's Unix 4.2 and AT&T's System V Unix features.

The C optimizing compiler will be bundled and shipped with OS/2. Pyramid's optimizing Pascal and Fortran 77 compilers are priced at \$6,000.

Pyramid Technology, 1995 Charleston Road, Mountain View, Calif. 94031.

8 Touch Technologies, Inc. has announced that its data base language Intouch can now call routines written in other Digital Equipment Corp. VMS languages.

Cobol, Fortran, C or Basic procedures can be executed from Intouch.

Touch Technologies, Inc., Suite 101, 609 S. Encinitas Blvd., Encinitas, Calif. 92025.

a spokesman said. No compiling or linking is necessary.

Intouch is priced at \$7,500 for the VAX-11/730 and Microvax II, at \$15,000 for the VAX-11/780, at \$25,000 for the VAX-11/780 and 785 and \$40,000 for the VAX-11/785.

Touch Technologies, Inc., Suite 101, 609 S. Encinitas Blvd., Encinitas, Calif. 92025.

8 Franz, Inc. has released Opus 42, a version of its Franz Lisp interpreter and compiler that is said to provide compatibility with Common Lisp and object-oriented programming capabilities.

A feature known as Flavors has been added to the Lisp kernel to give object-oriented programming capability, the vendor said. Other enhancements include the ability of

functions to return multiple values, a package feature that allows multiple name spaces to reside in the Lisp environment, hash table objects, closures to control the scope of a variable definition and a history mechanism.

Opus 42 costs \$5,000 for the first copy and \$1,000 for subsequent copies. The new version is available on processors from Apollo Computer, Inc.; Sun Microsystems, Inc.; Cadmus Computer Systems, Inc.; Masscomp; Tektronix, Inc.; Harris Corp.; and Digital Equipment Corp.

Frantz, Inc., 1141 Harbor Bay Plaza, Alameda, Calif. 94501.

8 A C compiler optimized for the Motorola, Inc. 68020 microprocessor is available from Alycon Corp.

The 68020 compiler will run under

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the following systems: Versados on most Motorola development systems; AT&T's Unix; Digital Equipment Corp. VAX VMS or Microvax computers; and Regulus on Ayclon processors, a spokesman said. An upgrade of Ayclon's C68 compiler, the C6820 contains the instructions and addressing modes of the MC68020 32-bit microprocessor and the MC68811 floating-point processor.

The C6820 is said to be a full implementation of the Kernighan and Ritchie C language specification and contains 100,000-plus processor, relocatable assembly, linking, loader, support library and utilities.

Support utilities download executable programs and symbol tables to the MC68020 target via a serial channel.

Prices are \$2,200 for Motorola hosts, \$2,000 for VAX Unix systems

and \$3,400 for VAX VMS computers.

Ayclon, 8710 Production Ave., San Diego, Calif. 92121.

ON-LINE DATA BASES

■ Zander Data Corp. is offering the Surface Electronics Component Acquisition Program data base of excess electronic and computer components that manufacturers want to sell.

The seller pays \$10 per item listed on the system plus a 5% commission when the material is sold. The purchaser pays the seller directly, a spokesman said. Users order items through the system; the owner of the material makes the delivery, according to the spokesman.

Upgrading the data base requires a

terminal or computer operating at 300 bps/sec. Menus direct users to the desired categories where a catalog of available items is displayed.

Zander Data, 2822 Commodity Road, Madison, Wis. 53711.

TRAINING

■ Panasonic Systems, Inc. has announced that video-based videodiscs are now available to aid users of Easytrieve Plus, the company's information retrieval and data management system.

The basic video course offers instruction on computers and storage and on how to create an Easytrieve Plus program. The intermediate course covers 10 topics, such as writing Easytrieve Plus procedures and

job activity tables.

The videos are free to Easytrieve customers with maintenance agreements. For new customers, the Easytrieve Plus videos cost \$3,000 each or \$3,000 for the two-video set.

Panasonic, 709 Enterprise Drive, Oak Brook, Ill. 60521.

From page 47

Notes from the software industry front
distressed firms in Europe, the Far East and Africa.

■ Relational Technology, Inc., Alameda, Calif., sold its Ingres relational data base management system to Easytrieve Plus as the foundation data management system for the Cambridge, Mass.-based university's Project Athena. Project Athena is an institution-wide project to integrate computer and communications capabilities into all phases of the educational process.

■

■ Segent Computer Systems of Beaverton, Ore., and Unity Corp. of Lake Oswego, Ore., have signed a marketing and distribution agreement that allows Segent to market and support the Unity relational data base management system as part of its Ingres 8000 parallel computing system. Unity was designed for AT&T Unix programming environments.

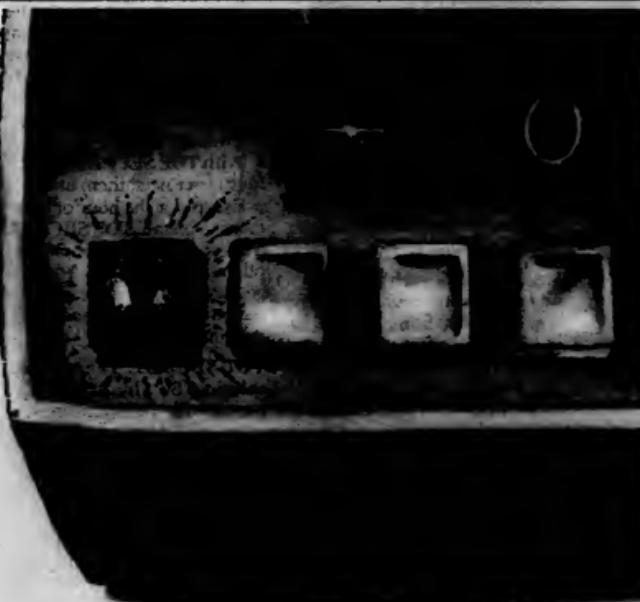
■

■ Cambridge, Mass.-based IBM Software Products Corp. and Digital Equipment Corp. of Maynard, Mass., inked a multiyear contract that allows DEC to manufacture, sell and support on a nonexclusive worldwide basis IBM Software Products' RS/1 engineering and scientific data analysis software. DEC previously sold RS/1 only in the U.S., Canada and Japan and did not provide technical support.

■

■ Tandem Computers, Inc., Cupertino, Calif., and American Management

Continued on page 56



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Micro-mainframe concept striving for MIS acceptance



To paraphrase Mark Twain: Everyone talks about micro-mainframe links, but no one does anything about them. Or so it must seem to the dooms of link vendors that have seen their wares picked over but infrequently bought.

The frustrating thing is that so many people, both MIS professionals and end users, can see that micro-mainframe linkage would be the answer to many of their problems. A link cannot only get data to a user

but also put the processing of that data into the end user's hands. More thoughtful MIS managers understand that putting data and processing directly into the environment will inevitably lead to cleaner data and more reliable processing.

Many observers have predicted a rapid increase in the use of micro-mainframe links. Instead, the growth in micro-mainframe applications has been relatively slow. But the term micro-mainframe link is already in danger of joining management information systems, distributed data processing, decision support systems and others that once promised to revolutionize data processing but instead were ignored or became objects

of derision.

Actually, the micro-mainframe concept suffers the opposite problem from the links listed above. Where they were heavy on conceptual light on practical choices, the micro-mainframe area presents a plethora of choices and, if anything, not enough conceptual glue to bind them together.

If, for example, micro-mainframe choices were limited only to data downloading, then, ironically, there would almost certainly be much more of it. The demand for data downloading is certainly high on most users' initial wish lists.

Downloading, if not too ambitious, can be accomplished relatively easily

and can offer real benefits, reducing rekeying, combining data from different sources, and so on. There are many products available that can perform downloading reasonably well.

But even within downloading there are two issues that have slowed acceptance. The first is that the very number of products that can serve people's needs hinders and may even immobilize the decision process. In addition, selectors assume, usually incorrectly, that they are making a long-term decision with many implications, similar to choosing a data base management system.

Intertwined with the selection problem is that of overspecifying. As users begin to understand what they might want in a link, they begin to want more. A awkward, current-generation downloading is not enough for them. What they really want is the type of interactive downloading that would result from cruising through the mainframe data base and selecting/joining whatever data they need.

Obviously, such tools do not exist yet. Even if they did, the complexity of real-world mainframe DBMS, both from a technical and conceptual standpoint, would make the exercise far beyond the capabilities of most users, even those who fancy themselves computer literate.

MIS staff members sometimes contribute to the overspecifying by listening too closely to what users think they want — and users have become much more assertive as a result of real and imagined successes in using micros.

Typical MIS mistake

Ironically, the typical MIS error is to try to plan too far into the future. Authoritative checklists recommend such micro-mainframe capabilities as microframe-type error checking and access security, multivendor environments, compatibility and operational efficiency.

These capabilities are excellent. However, in most cases they are examples of the best being the enemy of the good. Far too little is known about the ultimate uses of micro-mainframe links to be able to say "what the characteristics of any link should be within a particular organizational setting."

At the same time, one should not downplay the real problems that exist. Those organizations that have ventured beyond simple data downloading have begun to see that the real opportunities in the micro-mainframe environment are balanced by equally real problems.

What are the major problems? In strictly technical terms, users will not see seamless, distributed data base products for a very long time. Multiple data base management will be a painful experience where micro data bases are allowed to be both independent and meaningful.

As mentioned above, both data integrity and data security are in-

Continued on page 55

DOS VSE WITHOUT UCCEL SYSTEM MANAGER PRODUCTS

IS WORKING WITHOUT A NET.

O'Flaherty is a principal of information service strategies in Wood-Ridge, N.J. He consults on MIS planning and the development of computer-based products.

SOFTWARE & SERVICES

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UK users converting from DOS/VSE to MVS

Nothing with the equivalent credibility of RACF exists in the DOS/VSE market, Kerford-Byrnes said. Also, few, if any, source code compilers in the DOS market offer compatibility with MVS. "People aren't going to get hooked into a security system in the knowledge that they'll very likely have to abandon it when they go to MVS. So they decide to go straight to MVS."

Different auditors have different concerns. "Some don't like application programmers being able to change the little message on your credit card statement. Other companies don't like anybody being able to dial in, type in a password and get on-line to somebody's system. Others don't like the idea of source code even being read by anybody but the person who wrote it or the DP manager," according to Kerford-Byrnes.

Conversion outfits like MKB Technical Services are in demand because they have experience in DOS-to-MVS conversions, something few users can boast. "We know exactly the mistakes you can make. We know the things we must not do. In a DOS-to-MVS conversion, there is a list of things you must not do when setting up the MVS side of things. It's only once you've done those things you realize they're wrong. By that time, it's too late to go back," Kerford-Byrnes said.

For those shops that try conversion on their own, "It can stop appli-

cation development work dead for anywhere up to a year," Kerford-Byrnes said. Even for those that hire a service, there are risks. "There is always going to be some sort of interruption of development work, because somebody's got to clean it all out. Secondly, you have to provide education in the new technology."

Advanced planning consumes one-third of an MVS conversion project's time. Planning encompasses subroutines, source code, sequence of job execution, an inventory of every program to be converted, setting of standards and procedures and a target completion date schedule.

Training users in the new operating system is a major task of a good conversion service, Kerford-Byrnes maintained. "We provide education services to train the users in the standards and techniques

we've derived for that shop," he said. "We teach them to be self-sufficient." In conjunction with the conversion team, the users write the JCL and procedures needed to operate the MVS system. The system is brought up live by the users under the guidance of the conversion team, the consultant said.

While applications and operations personnel in a DOS shop may know how to run the company payroll program, blindsided, they are not so confident with a new system. "If you take a turnkey conversion service and they get MVS up and running for you, and three weeks later you find you've got to re-run all three weeks work because there was a user data error, how do you do it? All you have is the working payroll system and the JCL to execute it. You've still got to learn how to run the converted

system. And that is no small task."

The hardest part of the conversion process is taking applications that work in the DOS environment and making them work in the very different MVS environment. "You have to convert a lot of money converting something that works into something that works. Probably with a great deal of disruption, aggravation, hassles and bad feelings. With no immediate tangible benefit. That's a pitfall," Kerford-Byrnes said.

Despite the risks, the sooner users make the conversion the better, in Kerford-Byrnes' view. "The longer users leave it, the harder it will be, because they'll have more work to convert." Whether a user goes to MVS or directly to MVS/XA from DOS depends on the shop. "There's no point in spending all that money [for XA] if you don't need it," he said.

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Cobol 85 plods along on its way to acceptance

and culture. But changes to a programming language must be adopted in a more formal fashion to ensure that they are consistently applied. That is especially true in Cobol's case because it is the premier business-programming language and must mean one thing to all people if it is to have any value at all.

Thus it is ironic that the very process by which Cobol is upgraded and standardized is in danger of killing the language.

Perfectionists close to death

In the time since 25-year-old Cobol was born, the world of information processing has been completely reshaped. It is to the language's credit that it has survived this long. But during the period since 1978, when the Cobol 85 drafting process actually began, Cobol's image took a beating, and the language came perilously close to dying. Some said Cobol contracted an illness — obsolescence — from which it may never recover. Even an approved standard may not be medicine strong enough to save Cobol, they said.

Cobol has two things going for it of which the so-called fourth-generation languages, which have picked up much ground in the last few years, cannot boast. One is the gargantuan inventory of existing Cobol programs, which provides an incentive for shops to stick with Cobol. The other is the fact that Cobol is an industry standard, and no fourth-generation language has emerged yet to take on that mantle.

But even the most zealous Cobol

advocate would readily admit those qualities alone will do little to prolong Cobol's useful life. The only way it will survive is if new features and functions — that address the problems of productivity and maintenance — are added in a timely fashion. The drafters of Cobol 85 were well aware of that, and they took pains to implement a rich variety of features that make Cobol stronger.

However, many of the features embodied in Cobol 85 were envisioned years ago, and, had they been fully implemented in standard compilers, users could have enjoyed the benefits they offered much sooner. The overriding gap also precluded vendors from implementing selected features of Cobol 85 in their compilers before the entire standard was approved. That posed a problem for users, eager to take advantage of the new features, who had to choose among different compilers, each offering selected pieces of Cobol 85.

The standards-making bodies have taken steps to refine the draft approval process, and credit should be given to those ANSI and ISO members who pushed for reform. Essentially, Cobol will now be given new features — addenda — every two or three years, and the language will be fully overhauled every decade.

It is imperative that the organizations make those reforms work. And it is important that the groups continue to implement new procedures for improving Cobol — and other widely used languages — in a swifter fashion. Age alone is not a reason for Cobol to grow feeble and die. Those who truly care it must better address the task of ensuring its continuing health.



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Notes from the software industry front

mes Systems, Inc. (AMIS) of Arlington, Va., will jointly market the AMIS Computer Assisted Collection System to banks, financial houses and telecommunications companies as a result of an agreement penned recently by the two firms. AMIS will license the software, which supports the collection of delinquent credit accounts, directly to Tandem Nonstop processor users as part of the Tandem Alliance.

In artificial intelligence happenings, Inference Corp., Los Angeles, and SRI International, Inc. of Menlo Park, Calif., entered into an agreement through which Inference will train SRI knowledge engineers in the use of its Automated Reasoning Tool for expert systems development. SRI personnel will then provide consulting services for both Inference and SRI customers to aid in the building of expert systems.

Also in the AI world, Teknowledge Federal Systems, Inc. of Thousand Oaks, Calif., and Computer Thought Corp. of Plano, Texas, have indicated that negotiations are under way on a deal that would have Computer Thought convert Teknowledge's S.I. Version 2 knowledge system development tool to Ada. A Teknowledge representative said the conversion would allow the company's aerospace and defense customers to comply with the U.S. Department of Defense's Ada requirements.

Palo Alto, Calif.-based Quintus Computer Systems, Inc., developer of a Prolog compiler, and other programmers, unveiled agreements with Digital Equipment Corp., Xerox Corp., C. Itoh Data Systems and Agello Computer, Inc. DEC will market, sell and distribute Quintus Prolog for its VAX systems; Quintus will deliver a version of the compiler for the Xerox 1100 series of artificial intelligence workstations; Apollo will jointly market the Prolog tool for its Domain workstations; and C. Itoh will distribute Quintus Prolog for the Sun Microsystems, Inc. Sun-2 workstation in Japan.

Primavera Systems, Inc., Bala Cynwyd, Pa., and Control Data Corp.'s Cybernet Services Group have entered into an agreement that makes Primavera's Project Planner and Primavera graphics software a key component in Control Data's new Cybernet Express Project Manager engineering project management software.

Quadrature Systems, Inc. of Sherman Oaks, Calif., will supply six of its software products for Burroughs Corp., Detroit, 820/825 and 826 processors. The packages include Q-Office+, Q-File, Q-Plan, Q-Fact data base, Q-Chart and Q-Code source code script editor. Burroughs will support the software with its version of AT&T Unix System V, which is scheduled to be released later this year.

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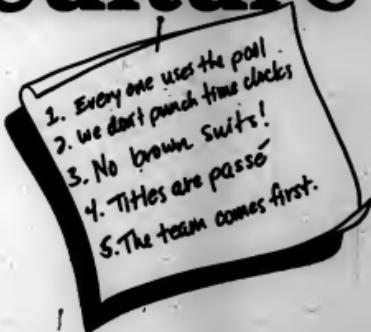
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IN DEPTH

Harnessing Corporate Culture

By Jane Linder

The unwritten rules of corporate culture can confound the neophyte and the veteran alike. But once alerted, information systems professionals can put culture to work for them.



A large, successful manufacturing firm was known for its decentralized decision making. Autonomous operating units were structured as profit centers with full line and staff functions.

In this environment, the vice-president of manufacturing asked his information systems manager to begin installing common systems throughout the plants. The idea made sense to the manager. He began to staff projects and move toward installation. After 12 months of conflict, arguments and all-out confrontations, the manager conceded defeat and left the company.

One could blame his political skills for the debacle; the truth is that he ran afoul of the company culture. In this firm, the operating managers held clear, indelible authority for results and the means of achieving them. There was no value on cooperation; competition raged between groups.

The vice-president who suggested the changes had neglected to inform the powerful plant managers that they were to accept common systems. Instead, he asked the information systems manager to brave those waters on his own. Without visible support from the top, the manager had

embarked on a countercultural effort to implement cooperation and some centralized decision making. From the outset, his chances for success were almost nil.

Corporate culture profoundly affects our ability to succeed. We can have a major influence on it.

Those who define culture speak of long-standing unwritten rules, matter-of-fact prejudices, customs for relating to colleagues or simply "the way we do things around here." Cultural anthropologists describe culture as a mechanism for adapting to the environment; in other words, culture is a set of behavioral prescriptions that help employees cope with the problems and decisions that face them daily.

These behavioral prescriptions represent, in codified form, the values of the company. Within a company, then, culture is an important mechanism for encouraging the "right" behavior — actions that uphold what the company stands for and help the company succeed on its own terms.

Culture influences both the systems we build and how we approach them. In addition, by building the "right" kinds of systems and using the "right" approaches, information systems can influence corporate culture.

Cultures vary tremendously, but five general dimensions describe common attributes of business culture (Figure 1, ID/2). These represent preferred behaviors: what is appropriate and

"smart" behavior within the organization and what is not. Although these attributes are clearly simplifications of complex behavior patterns, they are useful for analysis.

Helping the company succeed

Let's assume that we are trying to support a stable, strategically valuable, existing culture. For each cultural dimension, we can identify the kinds of systems and information systems approaches that are culturally consistent.

There are three reasons why a culturally consistent approach is important:

■ Well-defined cultures can help companies succeed. A strongly felt company culture encourages strategically correct behavior far more effectively than a network of control-oriented procedures. The culture's content — shared values, beliefs, implicit motivators — is a powerful, positive force in implementing company programs and guides behavior toward what is best for the firm. All things considered, it behoves information systems professionals to contribute to building a strong culture in whatever ways they can.

■ On a more pragmatic level, information systems professionals succeed more often when they understand the company culture. Using culturally consistent systems and approaches is simply less risky. When the system fits the way business is conducted, end users feel comfortable and are

IN DEPTH/CORPORATE CULTURE

satisfied customers. By carefully considering the firm's culture, MIS can make some predictions about what projects are most likely to succeed.

Very few of the tools for influencing culture are so easily engineered and implemented as information systems. Any information systems effort to influence culture should be part of the comprehensive, officially stated program.

Non-MIS tools such as compensation policy, hiring programs, supervisor training and management education are extremely influential to corporate culture. But their implementation is often longer term, so information

systems can have a much more specific, much more immediate impact on behavior.

Spotting conservatives

So-called entrepreneurial firms encourage risk taking and are informal, aggressive, even impulsive. Above all, they value results. Conservative companies tend to be exactly the opposite. They are typically risk-averse, formal organizations with deliberate decision-making policies. The people in them adhere to procedures — they focus more on how something is done than on what is actually achieved.

Xerox Corp. used to be considered entrepreneurial but now might be seen as

conservative. Most would agree that AT&T is trying to change from conservative to entrepreneurial. The stereotypical big company is conservative, and small one, entrepreneurial.

The entrepreneurial culture can be an exciting environment for information systems. Entrepreneurs are comfortable with state-of-the-art, unproven technologies. Their willingness to experiment can extend to challenging, high-payoff information systems projects.

Armed with a prototype approach, loose project definition and flexible tools, a staff of business analysts and technical wizards can match the action orientation that this culture values. Personnel should be dedicated to particular users and to maximizing service. In addition, a strong data administration function is vital to provide some glue between user-directed projects. (It need not, however, report through the information systems organization.)

The prototype methodology does not mean the entrepreneurial approach consciously abandons information systems planning. What is required is a top-down systems and telecommunications architecture — a rough blueprint for major data and processing blocks and the flows among them. Specific systems can be planned bottom-up with their respective users.

One problem that the MIS department faces in such a company is prudent resource management. One large entrepreneurial firm counted 1,100 MIS professionals in its ranks, compared with 250 in a conservative company with the same sales volume. Also, because of the interest in new technology, maintenance programmers and operations personnel tend to be accorded even less status than usual.

A final difficulty for information systems in an entrepreneurial firm is enabling sufficient data access. The type of ad hoc questions that this culture demands for fast, normally data intensive, answers. Add the fact that they are in constant flux and that information systems have great difficulty providing certified, available data.

In a conservative culture, on the other hand, proceduralized systems and proven technologies are preferable. Systems should be developed through a traditional life-cycle methodology using Cobol for efficiency.

The premier planning dimension in conservative companies is financial. Projects are selected based on tangible savings and return on investment, consistent with an overall spending guideline. All project and recurring expenses are charged back to the user to complete

the picture of financial accountability. A monthly user steering committee sets priorities and monitors resource allocation.

Information systems development personnel in a conservative firm should be organizationally pooled for maximum productivity. Some may argue about whether pooling achieves greater productivity, but the important point from a cultural perspective is that business units are not perceived as their respective users.

Maintenance personnel, on the other hand, should be dedicated to particular systems for operating stability. Strong, solid technicians should dominate the staff. The business savvy needed by individuals in the entrepreneurial setting is unnecessary here — the requirements are understood, and the pace of change is slow. Data center and telecommunications operations must be superb. These should be managed as factories using all the efficiencies made possible by a known environment.

Lines of authority

MIS issues in this culture include enforcing technology leadership. The upshot may be a chronic exodus of the most capable people to more exciting shops. Occasionally, a "soft" benefit project will be important for the company. MIS personnel must find ways to identify these and sell them to top management.

In one conservative bank, MIS was simply "jury-rigged" the cost/benefit projections to favor a telecommunications project. Senior management, comfortable with the financial analysis, approved a project that turned out to be unexpected.

Figure 1

is important for the bank's competitive position.

Companies with clear lines of authority place decision making in the hands of a specific person. They align authority with responsibility and reward people for "stopping the buck."

Opposite these companies stand firms with ambiguous authority, firms that need to build support for ideas and action plans before they proceed. They move toward matrix management structures where authority and responsibility are often shared or out of balance.

In many cases, an ambiguous authority structure is a veneer over highly centralized decision making. The military is an example of an organization with clear lines of authority. Texas Instruments Inc.'s pre-1963 matrix management structure — since changed — is an illustration of ambiguity.

Where lines of authority are clearly drawn, information technology can be developed accordingly. Departmental functions are automated under departmental aegis; the divisional data center can handle divisional decisions. Almost the only technology that cannot be distributed easily is corporate telecommunications.

The distributed architecture of hardware and software leads also to a hierarchy of data access in these firms. Each level of management receives the data needed to make the decisions for which it is responsible. Planning must be bottom-up, and MIS can play an important consulting role to ensure a coherent finished plan. Business unit managers should be allocated specific personnel and have ultimate responsibility for project progress and spending.

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IN DEPTH/CORPORATE CULTURE

The main stumbling block is project methodology in access to the real decision maker. As the anecdote in the beginning of this article indicates, the MIS manager failed partly because he took his orders from the vice-president. In that case, the plant manager turned out to be the real decision maker.

In this highly-delegated environment, however, some important central functions may lag. The firm must maintain a central technology scanning or research and development function to stay abreast of changes in the field. Once such a function is established, a corollary problem is disseminating its results. One large, decentralized chemical company staffs its central high technology group with people who have both technical and strong consulting skills. It is their job to sell innovations to their business constituents.

In an environment with ambiguous lines of authority and responsibility, "unowned," shared systems and large, tightly coupled systems fit well. Political links that substitute for individual operating decisions can be embedded throughout such systems. When these are managed by cross-unit steering committees, no single user has the authority to mandate substantial changes.

Because no one is really certain who will be making what decisions, users at all levels must have access

to the most detailed data. MIS project methodology must deal with the resulting confusion. Dimension time and detailed walk-throughs should be built into all but the smallest projects.

The same rules apply to whatever MIS planning is required. Planning is a consensual process, with MIS taking the lead to make things happen. In fact, MIS will find itself the agent of change on almost any front. This cultural bias should be reflected in MIS staff selection — strong "sales" personalities — and represents a structural risk in the ambiguous environment. A commitment to internal communications among a lean MIS senior staff substitutes for clear, articulated demand from the users.

Cooperative vs. competitive

Cooperative companies emphasize teamwork. People build strong relationships across organizational units and strata. Members should, as senior people nurture and cultivate their subordinates to succeed them. Competitive firms place great importance on individual achievement. They are populated with "stars" who close big sales or produce hit shows. Japanese firms epitomize the cooperative culture. The stereotypical large law office or consulting firm is competitive.

"Owned," shared systems are consistent with a cooperative culture. These are systems that are shared

among several operating units. Each has the freedom to go elsewhere, but they choose to share. To the extent that business conditions enable these users to cooperate, the versions of the system remain identical.

A cooperative culture is also fertile ground for systems that build

Figure 2

corporate data — where one group enters data so that another can add to it or use it. Also appropriate here are systems that enable easy access not only to cross-unit data but to ways of analyzing it, such as template libraries. For ownership, systems must be decoupled. But for the

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best access to data, systems must be integrated. The architecture is in a cooperative environment, then, is one of buffered integration and loose linkages.

Project methodology must be visually concerned with shareability. Strict technology standards will ensure that users throughout the company can share software and data. In a similar vein, the MIS planning process must include a coordination step after the initial buy-out effort. Personnel can be pooled, shared or moved across functions easily.

Implementing an architecture of shareable data and systems is not trivial. Strong central data administration, telecommunications and standards functions are critical. These groups can devote considerable energy to enabling broad access to certified data and to pacing the introduction of new technologies.

The competitive culture's separation shuns the MIS architecture toward single-owner sites with private data bases and strong internal security measures. Departmental computing prevails here. One large, competitive-culture firm had a separate data center for each business function — manufacturing, marketing and so on — and countless stand-alone mini-computer sites with Rube Goldberg-type telecommunications links between them.

The project methodology in a competitive culture must address security concerns in far more depth than other cultures require. In addition, existing systems should be periodically audited to ensure that they are

operationally sound.

To fit in this culture, information systems resources are thoroughly decentralized, with solid-line reporting and strongest loyalty to specific users. As MIS adopts the competitive "we-they" attitude, movement among information systems groups is difficult, and joint

projects are virtually impossible.

Whatever overall MIS planning and resource allocation is done in the province of a single senior executive, in keeping with the culture, unit plans are approved or denied at this level, almost unilaterally. MIS shoulders the burden of maintaining its service image when business unit

projects are cut.

The issues this culture raises for MIS are serious. Central functions such as standards, data administration, planning, R&D and telecommunications risk becoming empty and ineffective.

Lead vs. managed

When a company is led, it has clear, long-term goals to pursue. It has a vision of the future; it is creative; and it cares about the "big picture." A firm that is managed focuses on financial objectives that are often shorter in term. Its statement of values depends on the problem at hand, yet it is a holder of the latest analytical techniques. Lee Iacocca's Chrysler Corp., despite its attention to financial matters, is led. IBM and Hewlett-Packard Co. are led. Colgate-Palmolive Co.'s ill-conceived "shopping spree" of the '70s reflects the fact that it was managed.

The interesting thing about companies that are led is that they know where they are headed and what is important to them in getting there. Armed with this knowledge, MIS can build systems that provide specific information support. This is a corporate data revolution in all about. Computer systems can deliver strategically selected information to decision makers at all levels. This stands in stark contrast to a leaderless firm, which sits with a pool of detailed data, unable to decide which elements are important and which are not.

Organizationally, the strategically defined data bases demand a robust,

Figure 3



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data administration function. Because the driving force is company direction, MIS staff should include business analysts to make the connection between corporate strategy and their daily activities. Among the MIS executive's most important roles is gaining access to strategic circles in the company, so it is imperative that the MIS executive be a leader in his or her own right.

Information requirements in managed environments often because there is no substantive long-term direction. As a result, fine, detailed data bases must be maintained so virtually any question can be answered.

Managed firms are often concerned with their MIS spending as a percent of sales. The irony is that their short-term, financial objectives dictate expensive, detailed, central information sources. A short-term view — usually no more than one budget cycle — drives stopgap projects with short-term methodologies.

No energy is "wasted" on standards and documentation; the focus rests with on-time, in-budget delivery of today's top-priority projects. This is an exceptionally difficult goal to meet because the priorities change with the caprice of daily business problems.

To succeed in this environment, MIS must maintain a fluid organization and follow the shifting priorities. In addition, MIS staff members should plan to handle all projects within a single budget cycle. Longer term efforts are simply outside the attention span of the "managed" business.

The main problem MIS experiences in a managed culture is keeping personnel. Turnover often exceeds 40% per year. Of course, this undermines MIS credibility because undocumented, nonstandard systems are passed from one set of inexperienced hands to another.

Emphasizing ethics

Ethical companies distinguish outwardly between right and wrong. Their policies emphasize honesty and fair play. An ethical firm would never condone an employee bribing foreign officials, even if it were the foreigners' accepted way of doing business. So-called amoral cultures are closer to Machiavellian ones. Success is deemed good, regardless of

how it is brought about.

Ethics start with people, but computer systems can be supportive, influencing high standards of behavior with internal checks and balances. This form of "policing" is actually much more painless than audits and supervisory reviews. The more traditional approaches establish an atmosphere of defensiveness; people are automatically distrustful. Computer controls are automatic, quiet, depoliticized corrections.

Just as systems can support ethical behavior, an absence of computer controls is consistent with amorality. In one large high-tech firm, there was no automated (or even manual) system to ensure that what was shipped was also billed. There was no way to identify what capital equipment each department owned.

In that firm, company property commonly found its way into employees' homes. Sales representatives "loaned" units to favored customers. It is interesting to note that senior management turned to tighter computer controls for a solution.

In any analysis of culture, we must understand that a company is not homogeneous. Each division, sometimes each department, has a subculture of its own, even though the corporate culture is strong. MIS

franchise in several industrial lines. Its widely distributed consumer products unfortunately appealed to a steadily declining segment of the population.

Its sales had been flat for several years, and its profits were stable but softening. Some recent acquisitions, particularly in the hospital supplies area, brought in new products that ABC hoped would fuel future sales growth.

The company had a long-standing ethical and cooperative culture. Its lines of authority, however, were ambiguous that it could rarely put together an organization chart. ABC was extremely conservative — risk averse and process- rather than action-oriented. Its managers' days were filled with meetings in which very little was accomplished.

In addition, ABC was effectively managed by the one-year financial goals placed upon it by its parent company. ABC had no spelled-out strategy or long-range plan; it had no leadership.

One of ABC's largest rivals was using information systems to strategic advantage by offering terminals to purchasing agents who placed orders directly into the firm's order processing system. ABC's MIS people worked with its marketing sponsor to outline a system that would allow ABC to catch up.

Together, they envisioned a fully functional system that would be owned by marketing. Both MIS and the marketing sponsor were justifiably excited by the challenge and opportunity this project presented.

Figure 4

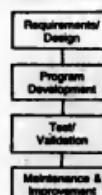
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IN DEPTH/CORPORATE CULTURE

Over the course of the project, there was some personnel movement. The manager in charge of development transferred. A new supervisor was installed between the project leader and the new manager. The marketing manager left the company.

Despite these developments, the project leader pushed on, selecting a distributed architecture. A local vendor was to provide a turnkey system with communications links and a language that were new to ABC.

Breaking the rules

This project broke several cultural rules. First, the strategic system that they envisioned could not easily exist in a managed company. Secondly, the MIS department planned a distributed system. The firm's ambiguous lines of authority made the aherant marketing champion a critical figure. Unfortunately, he had left.

In the aftermath, MIS failed even to convene a steering committee to shepherd the project. In short, they had no vehicle for building consensus. Finally, the lack of a charge-back system made it impossible for the department to tell the customer what the system cost. This uncertainty, in a conservative firm, proved disastrous.

The outcome? A working system was delivered. But there were so many technical and political problems with it that it was placed in endless pilot and eventually deprived of funding. MIS was credited with a failure.

ABC's long-range MIS plan also called for installation of a complete set of integrated manufacturing resource planning (MRP) systems with a common data base technology. Again, the MIS department led the effort, convincing the manufacturing vice-president that the project would pay off handsomely in the long run. A one-plant pilot was approved.

The department tackled the project with enthusiasm and professionalism. The package was implemented; the skeptical plant manager was converted to an ally; and the benefits were counted. All this took about a year.

The MIS management prepared a presentation for senior management to try and gain approval for the next step. The price tag was \$30 million, and the payback period was eight years. The project was turned down cold.

The MIS professionals had committed two fatal cultural errors. First, they had embarked on a multi-year plan in a managed, short-term-oriented company. To fit comfortably into this kind of environment, any project must be funded within a single budget cycle. Otherwise, it risks having funds cut off mid-stream.

In a related error, MIS undertook an effort with visible costs and less tangible benefits. Managed conservatives become very nervous when asked to fund projects with long paybacks of soft benefits.

The MRP II project was left in endless pilot as the MIS group was sent off to find a microcomputer solution that could be implemented on a shoestring.

A common mistake

XTZ Corp. was a high-tech firm growing at a 35% compound annual rate. Although only in its second decade, its market success had brought it into the Fortune 300.

"Very few of the tools for influencing culture are so easily engineered as information systems. Non-MIS tools are extremely influential but their implementation is often longer term."

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IN DEPTH/ CORPORATE CULTURE

The culture was, above all, entrepreneurial. It was ethical and competitive, with ambiguous lines of authority held over from its days as a smaller company. The original founder continued to lead the company with a clear, well-articulated vision for the future.

Because of its rapid growth, XYZ had outstripped the capacity of its core transaction processing systems. The director of MIS began a project to address order pro-

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Xerox used to be considered entrepreneurial but now might be seen as conservative. AT&T is trying to change from conservative to entrepreneurial.

cessing, billing, accounts payable and accounts receivable. As one might expect, MIS managed the project with a well-controlled, traditional life-cycle method. A user manager was

named to participate fully in the project team, and a respected consulting firm was hired to define and document the requirements. Their superior expertise was retained for general and de-

tailed system design and for programming. After three years, through major design revisions and about \$30 million in out-of-pocket expenses, there was still no system. After the third year, the name of the project was changed to conceal the continuing disappointment.

Where did MIS plan to go awry? In an entrepreneurial firm, the traditional MIS approach is dead wrong. Even though the systems they were building were tradi-

tional transaction processing systems, the MIS team should have been using a prototype approach.

Possibly the only way to satisfy these users would have been to define a broad architecture, then begin roughing in the pieces with high-level languages and packages. With rapid deliveries and an evolutionary attitude, MIS would have been able to keep pace with the needs of a changing business.

The first assignment given to the new MIS manager of XYZ was to investigate a stalled project and recommend an action plan. As he looked into the matter, he found two camps arguing over which software package to implement.

On one side, the user had selected a clearly superior package that was consistent with the way she did business. On the other side of the argument was the MIS director. He wanted to implement the system that was already being used worldwide for similar functional groups. Although the package was an older batch-type system, the MIS director believed consistency would serve the whole company better than a little extra capability in one group.

The MIS manager backed the user's choice rather than his supervisor's. Although he had conducted a thorough analysis of both systems, the real reason for his decision was cultural. He perceived the culture to be individualistic and competitive, not cooperative. In that environment, the key to success is meeting the needs of the user. Period.

Culture building

In general, MIS professionals can be more successful by identifying important aspects of their corporate culture and adjusting their policies and approaches to fit within the environment. Sometimes project success is a matter of changing only a few key, countercultural practices that have stymied solid efforts at progress.

Generally, consistent MIS activities will benefit the corporation by strengthening and solidifying the firm's culture. Obviously, MIS activities alone will not drive culture. They can, however, make a significant contribution toward influencing behavior and then values, as part of a coherent, culture-building program.

At the same time, MIS can participate in influencing culture. As we saw in the vignettes above, some of the cultural attributes of ABC Co. and XYZ Corp. were undesirable. With careful planning and the support of executive management, MIS professionals can play an important role in helping a firm modify its values.

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IN DEPTH

Software maintenance: penny wise, program foolish

By Girish Parikh

U.S. programmers shave days off software development time while squandering weeks on ad-libbed software maintenance. Soviet and Japanese companies have a jump on developing rigorous methods.

Computer professionals still ignore software maintenance. For software development, there are at least some methodologies, even if U.S. companies are drifting from them. But for software maintenance, there are no systematic methods in place yet.

The ideal way to systematize software maintenance would be to build techniques into the software development methodologies. Today most development facilities avoid dealing with the maintenance phase, and in this respect, they are incomplete. Judging from the alarming software maintenance statistics — 50% of DB budgets allocated to maintenance, more than 50% of programmer time consumed by ongoing maintenance, and more than \$30 billion spent on maintenance annually worldwide — the omission is critical.

The pervasive lack of attention to the subject persists on a national level. The much-touted race between Japan and the U.S. on developing fifth-generation computers receives wide publicity. But the one-sided competition in software maintenance, which may affect the eventual outcome of

the fifth-generation race, simply is not addressed by most computer professionals in the U.S.

Software maintenance consumes substantial resources. By streamlining and automating this work, the saved resources can be diverted elsewhere — toward developing applications for fifth-generation computers. Japan seems to understand the software maintenance problems and is making moves to solve them, as evidenced by the Software Maintenance Engineering Facility project under development by the Joint System Development of Japan.

The U.S. is perhaps more aware of the Soviet Union's threat to American technological supremacy regarding software. The fear seems to be: "The Russians are coming! The Russians are coming!" It seems to me that almost any country, even a developing one, can surpass the U.S. in the software field simply by making software reliable and modifiable and by developing modification techniques that can be taught.

On a company level, what is the effect of lack of attention to software maintenance for a data processing manager? The impact may or may not be immediately visible; however, the long-range effect can be devastating. When management considers maintenance a low-priority activity, the staff dollar maintenance gets the message immediately.

In most companies, development programmers also handle maintenance. Instead of using systematic maintenance processes and updating documenta-

tion, they rush through the work by passing the programs so they can get back to development work quickly. Over time, the programs become almost impossible to modify, and documentation deteriorates.

Cleaning up the maintenance mess will be much more difficult and expensive than preventing it in the first place. By instilling "positive maintenance attitude," by encouraging the use of software maintenance techniques and tools and by providing maintenance training, many problems can be avoided.

Weak foundations

I have been through the software maintenance trenches for several years and observed the weak foundations of many applications systems. At the moment, U.S. software consists of precarious skyscrapers of unstructured and disorganized code on the verge of collapsing under severe maintenance problems. A better balance cannot be attained unless these basic problems — not just the symptoms — are promptly solved, and new software is developed with a methodology that includes teachable modification techniques.

You cannot avoid software maintenance. It is intrinsic to software. Why not do maintenance right and avoid the problems?

To be complete, software methodologies must offer exact guidelines for maintaining the software

Girish Parikh is a Chicago-based consultant, lecturer and writer. His most recent report, "There Is A Fortune To Be Made In Software Maintenance Opportunities In the \$30 Billion Software Aftermarket," is published by Skatel Enterprises, Chicago.

developed with those methods. That way, the original structures are preserved, and maintenance operations can continue effectively, efficiently and economically. A methodology that can help solve the maintenance problems of unstructured software, as well as provide guidelines for maintaining structured software, would be even more useful.

Further, a country can develop national standards for software development and

modification. There is already at least one technology eminently suitable for such standardization: Jean Dominique Warner's logical methodology. The French systems scientist's technique

of designing programs, called logical construction of programs (LCP), is such that any LCP programmer can maintain almost any LCP program anywhere.

To my knowledge, Warner's

saving can be achieved by such national standardization and education.

In searching for the root of the problem, we have named Portman and Cobol as the culprits responsible for the development and maintenance problems. I do not think this is the case.

Although the trite phrase "It's the fault of the computer" is a popular one, we have all learned that the program can also be at fault. In fact, in almost all cases the program is at fault; it is relatively rare that a computer malfunction. So we changed our strategy and started blaming the "bug" in the program. But from where did the bug come?

What about

Of course, a high-level language or any language that helps develop clear structures can help prevent or eliminate bugs. However, to a large extent it is the program design that makes the difference. So if the program is poor, it's generally the fault of the program design or rather the fault of the programmer who did a poor job of designing. Or, in an all-too-familiar scenario, it is the fault of the programmer who did not even care to outline the program before starting to write code.

In a worst-case sense, this is like rushing to start building a house before preparing a blueprint. It will be a miracle if the house is built at all, and if it is built, it may not be functionally sound or even safe. And such a house, if it gets finished at all, would cost a fortune to build, not to mention its subsequent maintenance. How many times would it be torn apart and construction started all over?

Applying this same principle to coding without preparing a design outline, we see that maintenance for these programs is even more awkward than usual. The difficulty is intensified because typically there is no adequate documentation to support the maintenance effort.

Again I must point out that Warner's LCP technique can help design optimal (efficient in memory usage and execution speed), clearly structured, well-documented, reliable and easily modifiable programs. Programmers can code in Fortran, Cobol or almost any other programming language using LCP, because the design technique is independent of programming language and hardware.

LCP techniques can save a bundle in the long maintenance cycle, starting in the initial development stage. The techniques save in testing time during development and maintenance, as programs work on first or second effective test. Since, in

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IN DEPTH/SOFTWARE MAINTENANCE

the traditional development cycle, testing takes about 50% of resources and time. LCP techniques can save a bundle in initial testing alone, not to mention the continuing saving in the maintenance cycle. In addition, program modification techniques can be taught.

Learning on the fly

One observation illustrates how deep the maintenance problems reach. It may sound ridiculous to non-

DP executives, but it is a fact that in many large companies it takes about six months for a programmer to be productive in maintenance work. In the end, such work usually accounts to more than half of a programmer's responsibilities. Without formal methodologies, many of these programming professionals lack formal training in software maintenance, and they are forced to learn on their own. This pickup, on-the-job

training does allow them to complete the assigned work.

But maintenance skills learned the hard — and expensive — way, if they are learned at all, are generally not of much use when programmers hop jobs. Statistics quickly reveal the implications. Programmers change jobs every 15 years on the average. In all likelihood, they then spend another six months learning how to use the nonstandard maintenance techniques of their

new posts.

Ironically, the frustrating maintenance work itself contributes to the high programmer turnover. What a colossal waste of programming resources! It is easy to see why backloggs for new systems never amount to years in length.

Most companies contribute to this wasteful cycle by failing to take software methodologies seriously. Just look at the DP job section in the Sunday newspaper

of your city. How many companies look for designers and programmers with experience in a certain methodology? Most advertisements specify skills in programming languages (usually Cobol and even Fortran) and some software packages such as CICS and IMS, but not in software maintenance techniques.

We may be seeing a symptom of a deeper phenomenon. The concern of many DP managers seems to be to get the development job up and running, to get a pat on the back and maybe a promotion and a raise. If the system doesn't work out or if a time comes for them to modify or maintain their brainchildren, there is almost always another job to go to instead.

The concern of the U.S. still seems to be focused on the front-end work of development, even though software maintenance is estimated at 67% of the software life cycle. There are an estimated one million programmers in the U.S. alone, most of whom are spending more than half of their time on ongoing maintenance. But most training programs address only development issues. How much programmer time and resources are wasted doing trial-and-error maintenance, not to mention losses incurred because of incorrect changes?

Creating new methods

Though maintenance work is influenced by the development method used, (typically ad hoc method — that is, no method at all) we need to address maintenance problems on their own terms also. For a given development method, we should create maintenance techniques drawn from that method.

The task of creating maintenance techniques for unstructured software, developed without using any method, will be a challenge. But if we want to close the software maintenance gap, we must deal with these problems by treating the causes, not just removing the symptoms.

There are several options available for dealing with unstructured code, such as redeveloping, replacing with an off-the-shelf package and restructuring. In addition to techniques for maintaining software treated with the former options, techniques are also needed to handle maintenance work on the unstructured software as it is.

Understanding software becomes one of the keys to making computers cost-effective. With unstructured software, maintenance programmers spend about half their time just understanding the programs. If the tools and training are developed to expedite understanding of unstructured software, companies will realize a significant saving.



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The right choice.

Recently a debate has started about the validity of current terminology. An excerpt from Dr. Edger W. Dijkstra's privately published newsletter "EWD" in May 1983 pointed out that "maintenance" itself is a misnomer: "To begin with, a program is not subject to wear and tear and requires no maintenance." Dijkstra coined the term "structural programming" but has not coined a new term for maintenance; he simply means over the established one. Yet the term "program maintenance" has been in practice since electronic computing began over 30 years ago.

My question to those who have started debating over the term now is, where were you all this time? Of course, most of us were preoccupied with other computer topics — especially development. Though maintenance work was and is being done by

programmers around the world since the dawn of electronic computing, no one seems to have paid much attention to it or even to its name.

Was it laziness? Or did we have a misconception that by developing methodologies for the front-end development, software maintenance would naturally fall in place? Did we simply not have the foresight to worry about the future, to see what was going on below the surface in the real world?

Perhaps the reason lies in programmers' general distaste for software maintenance. Some even hate the work. They want to move high on the excitement of new development. It is a challenge to solve a problem by developing a new program. But once the program is installed, the excitement abates; programmers start seeking new pastures to satisfy their appetite.

Unfortunately, they have to work on existing programs. After all, these

programs were their (or their fellow professionals') brainchildren, and they cannot abandon them. There are heavy investments in existing software, and management wants to make the most of it. So programmers grudgingly carry on, correcting errors, modifying code, adding new requirements, adapting to new software environments and so on.

Instead of changing the label, why not develop a generally accepted definition of the term and go on to identify the various topics and subtopics involved in the subject. In other words, develop a taxonomy, define the terminology for the subject and then get on to the more important work of developing software maintenance methodologies, both technical as well as managerial. With a generally accepted terminology, we will be able to communicate with the world at large.

Time to act

In 1981 the National Science Foundation commissioned a group of industrialists, scientists and teachers known as the Computer Science and Engineering Research Study. Their study yielded a report that aptly predicted the threat to U.S. dominance in the software field:

"If software practices continue to drift, in 20 years the U.S. will have a national inventory of unstructured, hard-to-maintain, impossible-to-replace programs written in Fortran and Cobol as the basis of its industrial and government activities. Conversely, the Soviets may very well have a set of well-structured, easily maintained and modifiable programs in more modern languages because, in fact, they plan to leapfrog Fortran and Cobol."

"In this case, the competitive process of selecting efficient industrial processes among feasible alternatives will be impaired in the U.S. but facilitated in the USSR. We could then face a software gap more serious than the missile gap of some years ago."

Since then, it seems that fear has acted as catalyst for the U.S. Department of Defense to start the Software Engineering Institute centered at Carnegie-Mellon University in Pittsburgh. The institute plans to hire some 260 engineers to conduct a study of software methods and their application to defense systems. But it remains to be seen how the Software Engineering Institute tames the giant of software maintenance.

It seems that even in 1985, not much attention is being paid to software maintenance. It is naive to believe that by working on front-end development methodologies, the software maintenance problems will go away. In fact, if development is the front side of the coin, software maintenance is the other side, which stays much longer in view.

We are more than 30 years behind when it comes to software maintenance. We have awakened late. The giant subject of software maintenance may prove to be even larger than development and harder to tame. We have created enough mess with the existing software. Now instead of skirmishing around the real world, let's get started on the real world. Let's turn the subject into an engineering discipline, developing software maintenance tools and producing educational and training courses and materials.

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MICROCOMPUTERS

Rockwell signs unlimited license pact

Agreement authorizes duplication of Smart

By Eric Burns

OVERLAND PARK, Kan. — An unlimited software site license agreement, signed this summer, was recently renewed by Innovative Software, Inc. and Rockwell International Corp.

The deal allows Rockwell, which employs more than 100,000, perpetual worldwide rights to copy Innovative's Smart Software System, a series of integrated modules for the IBM Personal Computer and compatible systems.

Creating a standard for Rockwell, the arrangement will provide several important advantages, said Gordon Armour, staff specialist for emerging technology at Rockwell Defense Electronics Operation's information systems group in Anaheim, Calif.

According to Armour, these will include greater interchangeability of personnel, easier interchangeability of files, the de-

velopment of expertise with specific programs, general availability of high-quality software tools, a chance for broadened user training, the ability to create ancillary products and "the obvious economic benefits."

Rockwell, which expects to sign a similar deal for another type of micro software next year, did not disclose financial terms or reveal estimates of the number of potential customers involved.

In fact, the Fortune 500 firm did not discuss details on the magnitude of its micro installations at Innovative, which complicated initial negotiations. "That was the first hurdle we had to get over," Innovative Marketing Vice-President Ron Ferguson told Computerworld. "If you find out, I'll be glad to read about it."

However, Ferguson said, it made sense to sell a license as a service to an organization, as mainframe software may be sold, rather than by number of machines. "We as an industry may be setting some artificial limitations in terms of selling our services to this segment of the market."

Under the agreement, "Rockwell has

the right to duplicate and use the programs as they exist today; all sites unbundled," he said. Other contracts give Rockwell options to buy documentation updates or support from Innovative.

After anticipating the problems from Rockwell, Innovative will distribute and control the software internally through technical libraries. "We will have rigorous control procedures at the technical libraries," Armour emphasized. One benefit of these procedures is that as Smart Software enhancements come along, "we can simply pump the updates downstream," he said.

All software will have a special screen tailored for the company and an individual serial number, Ferguson noted. Although "we do not prohibit users from copying, Rockwell does not want them to do it from the perspective of control of updates," Ferguson said. Users will be reminded that the software is a corporate asset and that they are not authorized to copy it.

"With the employer behind that, there will be much less misuse within the organization," Ferguson said.

■ Gateway Communications rolled out a series of micro-to-micro and micro-to-mainframe communications packages/86

■ An expansion system that gives four-user capability to the IBM Personal Computer AT running PC-DOS was introduced by Aplex Technology/86

■ Samna enhanced its Samna + integrated software/86

INSIDE

Software/86
Communications/86
Storage/86



Micro vendors willing to deal

The year 1985 has been far from a gangbuster one for microcomputers on far, but the landscape is changing lately — most noticeably in software licensing.

After a year and a half of sound and fury about site licensing, we're starting to see some significant activity. Behind the flurry of announcements, which turned out to be simple volume purchases (stop the press), are coming contracts with genuinely different contract arrangements.

One example is Innovative Software, Inc.'s recent agreement with Rockwell International — a perpetual, worldwide unlimited license for the Smart System software (see above story).

Controlling site software

Negotiations may be a lengthy, complicated process — for example, Rockwell would not tell Innovative exactly how many micros were installed — but they hold the promise of coming up with a more sensible way for corporations to buy, distribute and control micro software.

We're also seeing a host of vendors dropping copy protection. Many of these are tiny firms, struggling to stay alive in a slow market that has created some significant disappointments even for stars like Lotus Development Corp. But regardless of vendor motives, dropping copy protection makes life a little easier for corporate users.

Microsoft Corp. bit that particu-

Software Publishing enhances PFS:Write word processing

Software Publishing Corp., based in Mountain View, Calif., has enhanced its best-selling PFS:Write word processing package for the IBM Personal Computer and compatible systems, providing an integrated spelling checker, wider document, additional character enhancements, micro-justification, context-sensitive Help screens and a quick-save feature.

Available now at the same retail price of the previous version, \$140, the upgrade uses features requested in 1,500 responses to a customer survey that Software Publishing carried out earlier this year, according to product manager Dave Burns.

PFS:Write's spelling checker uses a 75,000-word dictionary to correct documents for misspellings, typographical errors, repeated words and incorrect capitalization, according to the vendor.

The package now supports documents up to 250 characters wide and offers additional character styles such as italics, super-

scripts and subscripts.

The quick-save feature permits users to save documents with a single keystroke during editing, rather than requiring them to go out to the main menu, Burns noted.

Current PFS:Write customers can upgrade to the new version for \$35, according to a company spokeswoman. Software Publishing also is offering the software bundled with PFS:File, PFS:Plan, four utilities and two diskettes for \$350.

PFS:Write requires IBM's PC-DOB or Microsoft Corp.'s MS-DOB 2 or higher and 256K bytes of random-access memory.

Software Publishing declined to give sales figures for PFS:Write, although it noted that independent research by Software Access International, Inc., a Mountain View firm, found that the software is the most popular word processing package available for less than \$300. More than 1.7 million PFS series packages have been shipped, the spokeswoman said.

Ven-Tel takes wraps off modem

Internal, stand-alone versions offered for IBM micro families

Ven-Tel, Inc. of Santa Clara, Calif., has announced a 2,400 bit/sec. modem for the IBM Personal Computer series in both internal and stand-alone versions, both priced at \$400.

The Half Card 24 expansion card reportedly provides communications for the micro at 2,400, 1,200 or 300 bit/sec. The card fits in a slot in the Personal Computer XT and uses the standard Personal Computer 8-bit parallel port.

Half Card 24 is said to be fully compatible with Ven-Tel's Half Card 1,200 bit/sec. modem and the Hayes Microcomputer Products, Inc. 1200B. It also supports software available for 1,200 bit/sec. modems and

comes packaged with Microsoft, Inc. Crosstalk XVI communications software.

Other features include local and remote test modes, call progress reporting, automatic speed selection and automatic fallback to 1,200 bit/sec. when calling another modem operating at the lower speed.

A spokesman for Ven-Tel said the 2400 Plus stand-alone modem is fully compatible with the Hayes Smartmodem 1200 and the Ven-Tel 1200 Plus. The autodial, autodialer and timer can operate in both asynchronous and synchronous modes.

The stand-alone modem also includes automatic fallback, compatibility with 1,200 bit/sec. software, local and remote test modes and call progress reporting. Both the stand-alone and internal products are AT&T Bell Laboratories 213-A compatible at 1,200 and 300 bit/sec. and V.22bis-compatible at 1,200 and 2,400 bit/sec.

Continued on page 66

Samna upgrades tool to aid data transfer

Samna Corp. of Atlanta has announced an enhanced version of its Samna+ integrated software that reportedly supports the Document Interchange Format (DIF) for easier data transfer with other spreadsheet packages.

Release 3.1 of Samna+, the so-called Turbo version, is said to perform common operations faster than Release 3.11. DIF support facilitates the exchange of Samna+'s word processing, word-base management and spreadsheet data with Lotus Development Corp.'s 1-2-3 and Symphony.

Samna Turbo is targeted for IBM Personal Computer users, producing extensive documents with numerical data. The software requires a minimum of 415K bytes of

memory, excluding the requirements of the PC-DOS operating system.

The product is priced at \$495. Users of Release 3.11 may upgrade for \$40 or at no cost if they purchased the previous release after July 23.

Corona Data gives micro MS-DOS, net

Corona Data Systems, Inc. of Thousand Oaks, Calif., has announced that its shipments of the Mega PC micro after Oct. 1 will include the Microsoft Corp. MS-DOS 2.10 operating system with the MS-Net local-area network software.

The bundled software reportedly allows the Mega PC to expand to up to eight user workstations.

The new operating system and local-area network are included in the price of all Mega PC systems. Current users of MS-DOS 2.11 on the Mega PC may upgrade to DOS 3.1/MS-Net free of charge.

Prices for the Mega PC are \$5,345 for the 10M-byte hard-disk version and \$1,675 for each additional workstation.

SOFTWARE

Information Technologies, Inc. has cut the price of its terminal emulation software for the IBM Personal Computer line.

The firm's Linkup System Comix reportedly enables an IBM Personal Computer to connect to an IBM 3274 or 3276 controller and to emulate an IBM 3278 or 3279 terminal.

Linkup System Comix now sells for \$495. The product previously sold for \$995.

Information Technologies, 7850 E. Evans Road, Scottsdale, Ariz. 85260.

Continued on page 80

Interactive enhances PC Screen

Interactive Data Corp. of Waltham, Mass., has announced an enhanced version of PC Screen — the IBM Personal Computer XT and AT software interface for the vendor's Standard & Poor Corp. Computer Financial data base.

Version 2 features code re-written in Lattice, Inc. C lan-

guage that is said to halve the software's response time. Increased calculating power reportedly allows processing of nested match calculations.

PC Screen examines data on publicly traded companies according to criteria set by the user, including available variables, ratios or user-defined calculations.

PC Screen requires a micro

with a minimum of 256K bytes of memory and the user's subscribed license to Compustat.

PC Screen Version 2 is available to current users free of charge. The annual license fee for Interactive Data's Financial service is \$15,000 for the first user in an organization and \$7,500 for each additional user.

TI announces the portable sales tool for General Electric Plastics' field communications.

Interest exists with their salesmen data base and 24-hour communications with headquarters. That's what the SILENT 700™ Model 707 with its easy access module means to GE Company's Plastics Sales Division.

Regardless of the hours and where data comes from the home office, GE Senior Sales Representative Ray Forrester can get the latest product data and cost analysis information he needs to prepare for and close a sale. All he needs is his TI 707 portable data terminal and a telephone.

"With this terminal, I can access two GE Plastics data bases. When GELIS (Engineering Resins Information System) is accessed by any TI 707, I can provide a customer with technical information and product specifications on the spot and have him with a printout to review.

"The terminal also acts as my message center when I'm in the field. I can...

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modem manager through the OFC Console (electronic mail), and the individuals receive them in written form when they pick up their message. They seem to respond more promptly with accurate, hard copy in front of them. And since I can receive messages anywhere, anywhere, the TI 707 also eliminates 'telephone tag.'

Ray Forrester believes that the TI 707 is ideal for the salesman on the go. It's lightweight and rugged, takes up approximately one half of a briefcase, and is quiet even at peak operation. "It's exactly the productivity tool we need for our direct field communications," he concluded.

Find out about the Model 707. SILENT 700 Portable Data Terminal from TI and how it can solve your communications problems. Call 1-800-527-3500, ext. 709; in Canada, 416-684-9669. For more information write TI, P.O. Box 50963, Dallas, DTB 75207, Texas 75290-9063.

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MICROCOMPUTERS

From page 59

Software

Boston Business Computing, Ltd. (BBC) has introduced software permitting Digital Equipment Corp. VAX mainframe maintenance functions to be performed on micros.

The software, BBC PC/EDT, is said to provide the functionality of VAX EDT Versions 3 through 17 for DEC PDP-11 and of VAX/VMS Version 4 on the DEC Rainbow, the IBM Personal Computer, Personal Computer XT, AT and compatible computers.

Editing features include multiple buffers; undelete line, word and characters; and redefine keyboard.

Users can execute PC-DOS or MS-DOS commands from BBC PC/EDT, the vendor claimed. The software supports directory and subdirectory commands for PC-DOS or MS-DOS

Versions 2 and higher and requires one disk drive plus 128K bytes of memory.

BBC PC/EDT costs \$200, the vendor said.

BBC, P.O. Box 121, 1211 N. Main St., Randolph, Mass. 02368.

Software for plant and facility maintenance that runs on the IBM Personal Computer XT and AT is available from Project Software & Development, Inc.

Called Maximo, the package is said to perform work order tracking, inventory control and equipment history applications for a range of sites, including manufacturing sites, hospitals and universities.

Maximo uses a mouse and menu-driven screens that users can design by adjusting parameters such as

length and field descriptions. A report writer produces predesigned or user-formatted reports containing data for work orders, inventory or equipment history, the vendor noted.

Maximo runs on the IBM PC-DOS 3 or higher, 128K bytes and requires a hard disk and 640K bytes of internal memory. Maximo is available as software only or as a turnkey system. The software-only package includes the program, reference manual, tutorial and mouse for \$17,900.

Priced at \$22,000, the turnkey system includes the software, a 640K-byte IBM Personal Computer AT, 20M-byte hard disk and color monitor with Personal Computer interface.

Project Software & Development, 20 University Road, Cambridge, Mass. 02138.

SDecisions, Inc. has wrapped a program that runs on the IBM Personal Computer and compatible systems for calculating the cost of running a business.

Called Costline, the program projects all facets of a company associated with a single lease from the corporate tenant point of view by accounting for actual or proposed lease provisions and by comparing alternate lease proposals on a present value or level rent annuity basis, the vendor explained.

Turncost costs \$495.

Costline, 1800 Post Road E., Newport, Conn. 06850.

Assimilator, Inc. announced an interactive program that combines word processing with data base storage, manipulation and merge features for the Apple Computer, Inc. Macintosh.

The program, known as Business Essentials, contains two modules: Autorewriter and Data Merge.

Autorewriter, the word processing component, is said to store words, names, numbers and paragraphs in the Macintosh for later insertion into standard correspondence forms.

The data base module, Data Merge, can list 600 items in 16 different fields for cross-referencing and manipulating data, the vendor said.

Business Essentials costs \$79. Assimilator, 405 Alberto Way, Los Gatos, Calif. 95030.

Reference Software, Inc. offered software that lets IBM Personal Computer users access the Random House Dictionary and Random House Thesaurus.

The package, called Reference Set, allows users to check the spelling of words, find synonyms and insert changes directly into text without having to exit programs or save files.

Macros are provided for storing words and phrases that a writer uses repeatedly and for entering these text strings with one key stroke.

Reference Set runs on the IBM Personal Computer, Personal Computer XT, AT and compatible computers. It requires IBM PC-DOS or Microsoft Corp. MS-DOS Version 2 or higher, 128K bytes of memory and either two floppy disk drives or a hard disk drive.

The software package costs \$89. The dictionary and thesaurus are available separately for \$60 each.

Reference Software, 2353 Boulevard Circle, Walnut Creek, Calif. 94598.

Primavera Systems, Inc. has released Version 2.5 of its project management and control system, Primavera Project Planner, and Version 1.6 of Primavera, a compatible graphics plotter package. Both run on the IBM Personal Computer.

Version 2.5 of Primavera Project Planner provides screen graphics to view activity data in bar charts, resource and cost histograms and resource and cost profiles.

Users can produce graphics displays for all project activities or use the automatic sorting feature, Auto-sort, to look at only selected activities. Scrolling allows users to view a specific time period or group of activities, the vendor noted.

Continued on page 61

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Continued from page 60

Other project management system enhancements include free-float computation, reporting and a sort/select, which allows an activity to be deleted from without affecting the start of its successors.

In addition, a Generate command creates text files in the same format used to input records in Primavera's batch system. The command reportedly lets users break large networks into sub-networks by transferring files to a relational data base or report writer for further processing or by reentering files in the project manager for updating progress and performing "what-if" analyses.

Primavision Version 1.5 offers full match lining of multipage plots to produce images that span up to 10 sheets. Relationship lines on time-scaled logic diagrams can be suppressed to compress charts, according to the vendor.

Other upgrades include the ability to increase lettering sizes, thermometer bars for charting progress on a bar chart and network logic diagrams, the ability to save plots to user files and the ability to generate plots using start and end days and months.

Version 1.6 also adds support for Calcomp's 1040 and 1070 series plotters and other 907 Calcomp controller plotters.

Primavera Project Planner, at \$2,500, and Primavision, at \$1,500, run on the IBM Personal Computer, Personal Computer XT, AT and other compatible microcomputers. A minimum configuration is 512K bytes of memory, a hard disk and DOS 2 or higher, according to the vendor.

Primavera Systems, Suite 225, Two Bala Plaza, Bala Cynwyd, Pa. 19004.

■ A sales/contact management system for the IBM Personal Computer, Personal Computer XT and compatible machines is available from Business Systems International, Inc.

Called Salesbase/PC, the package is said to schedule follow-up actions, maintain a data base of contacts, create selected or mass mailings, forecast sales, record customer purchase histories, automatically dial contact phone numbers directly from the data base and create tutorial screens for on-line sales training.

The software also includes an on-line Help facility that can be accessed with one keystroke, the vendor noted.

System requirements are 256K bytes of memory, IBM's PC-DOS or Microsoft Corp.'s MS-DOS Version 2 or higher and a monochrome or color monitor. Salesbase/PC costs \$295.

Business Systems International, 30042 Oberne St., Camino Park, Calif. 91304.

■ A word processing package that includes a 100,000-word dictionary, thesaurus, document indexing and word library. For the Apple Computer, Inc. Macintosh computer is available from Rio Grande Software, Inc.

Called RGW Wright+, the word processor is also said to provide a math module,

graphics package, on-line Help facility, an undo function and the ability to merge data and charts into new and existing documents, the vendor claimed.

RGW Wright+ is compatible with Corvus Systems, Inc., Devron, Inc. and Tector, Inc. hard disk drives and interfaces with Apple's Macwrite and Macpaint. The software sells for \$195.

Rio Grande Software, Inc. Box 5806, 221 Melrose, Melville, Texas 77504.

■ **Fast Forward, Inc.** has developed an electronic bulletin board with security, electronic mail and information file transfer capabilities for business users of the IBM Personal Computer.

The electronic mail facility, known as Corporate Bulletin Board (CBB), includes an on-line text editor and is said to let users create public or private menus, certified mail, carbon copies and mailing lists. It reportedly allows

the user to upload menus as files, edit and forward menus and keep confidential messages in private mailboxes.

CBB can transfer software programs, spreadsheets, word processing documents and data base files from one unit to another, including exchanging files between the Apple Computer, Inc. Macintosh and IBM Personal Computer. An Xmodem error-checking file transfer meth-

Continued on page 63



Introducing the TI 880 AT Printer. Because you need a multi-user printer that works overtime.

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Continued from page 61
of given 99.6% error-free transmission over noisy long-distance lines, the vendor claimed.

Data protection is provided by passwords and security levels. A call log records system activities, including security violations and incorrect passwords.

CBS runs on the IBM Personal Computer, Personal Computer XT, AT and compatible computers. The software supports IBM's Token Ring and Digital Research Inc.'s Concurrent PC-DOS in both foreground and background modes, the vendor said.

A minimum configuration is 192K bytes of random-access memory, two floppy disk drives, a Hayes Microcomputer Products, Inc. Smartmodem card, asynchronous communications card and communications software.

CBS sells for \$495.

Paul Fournier, P.O. Box 14706, Portland, Ore. 97214.

■ Semantic Microsystems has announced MacScheme, an implementation of Lisp for the 613K-byte Apple Computer, Inc. Macintosh.

MacScheme is said to conform to the standards for Scheme, a Lisp dialect, and to support such Common Lisp features as lexically-scoped variables, first-class procedures, macros, generic arithmetic including floating-point and infinite precision integer arithmetic and the concept of continuations.

The software reportedly provides an interpreter with runtime error detection and debugging plus a Smalltalk-like interface that offers multiple scrolling windows.

MacScheme costs \$125.

Semantic Microsystems, Suite 543, 1001 Bridgeway, Sausalito, Calif. 94965.

■ Rockwell Software Corp. has wrapped RIDE/DM, a version of the high-level business language RIDE, that is said to let programmers develop multilayer data base applications for networked personal computers.

RIDE/DM works with The Database Machine, Cogen Data Technologies, Inc.'s board for the IBM Personal Computer, Personal Computer XT and AT, which acts as both file server and hard-disk controller for the network. The Database Machine gives networked micros simultaneous access to shared data files.

The software includes RIDE programming features such as a screen forms manager and string processing. RIDE/DM sells for \$495.

Rockwell Software, 3000 Holman Road, Boulder, Colo. 80301.

■ Colorbeam Corp. has upgraded its Picturemaker three-dimensional design and animation software—which runs on the IBM Personal Computer—with additional imaging and motion scripting features.

Imaging enhancements include texture mapping to superimpose two-dimensional images onto 3-D objects, shading to create reflective surfaces and the ability to generate transparent objects.

New motion scripting features include velocity profiling, which allows an animator to vary how fast an object accelerated in 3-D space, and metamorphosis, which smoothly transforms a 3-D shape into another.

Picturemaker costs \$29,500.
Colorbeam, 2165 Addison St., Berkeley, Calif. 94705.

■ West End Files, Inc. has added anti-aliasing to its Artwork three-dimensional display list drawing software for the IBM Personal Computer and compatible computers.

Anti-aliasing is a technique that is used to eliminate the jagged edges that appear in computer-generated images by ramping the edges on lines and planes of color to fade into the background and appear as a higher resolution image.

Anti-aliasing in Artwork requires the Number Nine Computer Co.'s Number Nine Revolution graphics card, the vendor said.

Artwork software costs \$2,450.

West End Files, Inc. has added anti-aliasing to its Artwork three-dimensional display list drawing software for the IBM Personal Computer and compatible computers.

■ Gamma Productions, Inc. has announced the Gamma-Net 3.1 local-area network for the IBM Personal Computer, based on the MIL-STD-1543 standard developed for digital data communications on board military aircraft.

Gamma-Net 3.1 runs at 231 bit/sec. with a data throughput of up to 16K bit/sec., a spokesman said. The product supports IBM's PC-DOS 3.1 software and can service up to 256 nodes.

The network is installed using coaxial cable and an add-on controller card for each node. The card can be installed in an IBM Personal Computer.

er, Personal Computer XT, AT and compatibles.

Features include collision avoidance and collision detection, error-checking on three levels and packet size varying from 4 bytes to 64K bytes. Cable segments can be as long as 1,500 ft. of RG-58-type coaxial or up to 4,000 ft. of RU-8-type coaxial without repeaters.

Gamma Productions, Suite 102, 817 10th St., Santa Monica, Calif. 90403.

■ Software, Inc. has announced three versions of its Software PC terminal emulation software. The program now runs on the Texas Instruments, Inc. Professional computer, NEC Corp. Advanced Personal Computer.

Continued on page 64

COMMUNICATIONS



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MICROCOMPUTERS

Continued from page 63
puter III and the Wang Laboratories, Inc. Professional Computer.

Software PC reportedly includes emulation capability for more than 30 terminals, including the Digital Equipment Corp. VT100 and VT220, IBM 3101, Data General Corp. D3000 and D410 and the Televideo Systems, Inc. 925 and 960. The software also includes file transfer and utility functions.

The software requires a micro with a minimum of 256K bytes of memory, a monochrome or color monitor and Microsoft Corp. MS-DOS 2. The TI Professional computer version also requires an asynchronous communications controller card.

Each of the three versions is available for \$196.

Softronics, Suite 303, 7730 N. Union Blvd., Colorado Springs, Colo. 80918.

■ Syntech Corp. has released a data communications processor for Intel Corp. Multibus-based microcomputers that was designed to provide serial interfaces with a wide range of standard and custom communications protocols.

The four-channel DCP-8804 board is said to raise system throughput by off-loading communications-related functions from the main computer. It enables Multibus-based machines to operate in asynchronous, biynchronous, Synchronous Data Link Control, X.25 and Systems Network Architecture communications protocols.

For OEMs, the company also provides AT&T Unix-compatible software that enables that OEMs to adapt the DCP-8804 to their computers.

The DCP-8804 with 256K bytes of random-access memory costs \$3,575. The X.25 optional software costs \$7,000. Installation of an IBM 3780 emulation package costs \$4,500, and the license fee for remote job entry software is \$200.

Syntech, 6465 Nancy Ridge Drive, San Diego, Calif. 92121.

■ Avatar Technologies, Inc. has announced a hardware and software system that reportedly transfers files between the Apple Computer, Inc. Macintosh and a host IBM mainframe running CICS, TSO or CMS.

Macmainframe was designed for use with Avatar's standard host file transfer software running on the mainframe. Macmainframe is said to give Macintosh users full IBM 3278 terminal emulation and either local or remote connection to the host, with dial-in capability for multiple users.

The hardware unit connects an IBM 3274 or 3276 control unit to the Macintosh model port with coaxial cable. It reportedly provides an auxiliary RS-232 port with terminal pass-through capabilities for asynchronous communications.

The Macmainframe software reportedly operates in conjunction with Apple's Masterterm program, allowing file transfers to be set up in

standard Macintosh format with the mouse or keyboard. Macmainframe is compatible with Avatar's Turbo link or IBM Personal Computer-to-mainframe links.

Macmainframe is priced at \$1,200.

Avatar Technologies, 99 South St., Hopkinton, Mass. 01748.

■ Gateway Communications, Inc. has announced Advanced Network/G, a network operating system compatible with IBM's PC Network and PC-AT and compatible computers and is said to support up to eight file servers on a local-area network.

Advanced Network/G runs on Gateway's G/NET, a network that interconnects the IBM Personal Computer, Personal Computer XT, AT and compatible computers and is said to be compatible with the standard defined by Microsoft Corp.'s MS-NET and IBM's PC Net with PC-DOS 3.1.

Multiuser applications software running under PC-DOS 3.1 will reportedly operate unmodified in the Advanced Network/G environment.

Features of the network operating system include electronic mail, remote workstation access, full-function printer spooling, system security and applications development support.

Advanced Network/G is priced at \$1,595. Each file server on a network requires a separate copy of the software. Network/G users can upgrade to Advanced Network/G for \$295.

Gateway Communications, 16782 Red Hill Ave., Irvine, Calif. 92714.

■ Grafpoint unveiled a Tektronix, Inc. 4197 graphics terminal console line package that lets MS-DOS-based personal computers locally run high-performance graphics software and off-load graphics operations from a host.

Called Tigray-07, the software supports ports from 640- by 480-pixel to 1,024- by 1,024-pixel resolution boards, including the IBM Enhanced Graphics Adapter, the IBM Professional Graphics Adapter, the Verticon, Inc. M-16 and the TAT Galaxy series.

Additional boards supported include the 720- by 500-pixel resolution Texas Instruments, Inc. Professional and the 640- by 400-pixel resolution AT&T Personal Computer 6300, NEC Corp. APC III and Sperry Corp. Personal Computer.

Tigray-07 is said to be compatible with such mainframe packages as Minneapolis, Minn., Computer Services, Inc. Avril-4000 three-dimensional computer-aided design system and United Computing Services, Inc.'s Ansys.

Tigray-07 sells for \$995.

Grafpoint, 4540 Stevens Creek Blvd., San Jose, Calif. 95129.

STORAGE

■ Cipher Data Products, Inc. has introduced its Series 2000 system, a transportable 9-in. tape subsystem for use with the IBM Personal Computer line.

Continued on page 66

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- Generation of constant object code. Rerunability allows many users to share the same code. Rerunability is not an easy feature to achieve on the 370, especially if you use non-constant external variables, but we did it.
- Optimization of the generated code. We know the 370 instruction set and the various 370 operating environments. We have over 100 staff years of assembler language systems experience on our development tools.
- Generated code executable in both 24-bit and 31-bit addressing modes. You can run compiled programs above the 16 megabyte line in MVS/IX.
- Generated code Modular for OS and CMS operating systems. You can move modules between MVS and CMS, without even recompiling.
- Complete libraries. We have implemented all the library routines described by Kernighan and Ritchie (the informal C standard), and all the library routines supported by Lattice (except

operating system dependent routines), plus enhancement for dealing with 370 specific environments directly supported by Lattice in our library—available Under-Style IO source methods.

- Built-in functions. Many of the traditional string handling functions are available as built-in functions, generating in-line machine code rather than function calls. Your call to move a string can result in just one MVC instruction rather than a function call and a loop.

In addition to mainframe software development, you can also use our new cross-compiler to develop PC software on your IBM mainframe. With our cross-compiler, you can compile Lattice C programs on your mainframe and generate object code ready to download to your PC. With the cross-compiler, you can also write PL/370[™] and PL/3270[™] by Phoenix Software Associates Ltd. The Phoenix linker and library management facility can load several compiled programs on the mainframe and download immediately executable modules to your PC.

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COMMUNICATIONS

Communications tool for file transfer bows

By John Gallant

MATTHEW, Mass. — Software Research Corp. recently announced a file transfer communications software that will allow processors from IBM, Digital Equipment Corp., and Wang Laboratories, Inc., to share files and networking capabilities.

Software Research's **Network Environment** (NE) includes **File Transfer for Xenix**, the first of a planned series of NE products; the **File Transfer software runs as an application under IBM's MVS or MVS/VS, DEC's VMS, Wang's VS, IBM's PC-DOS and Microsoft Corp.'s MS-DOS operating systems and supports messaging and a variety of file transfer protocols between the diverse systems.**

Using NE, users can control or convert data as a central or converting node, a spokesman for Software Research said. **File**

Transfer allows users to link IBM's VAX, Wang's VS mainframe and IBM's Personal Computer, Personal Computer XT's and compatibles or nodes off the mainframes. The software provides the file transfer and messaging capabilities between any two of the nodes.

File Transfer supports text or binary data file structures including IBM's VMS, Open, partitioned data set and generation data group (GDS), IBM's Wang, and PC-DOS and MS-DOS sequential files. In addition, the product performs any ASCII or binary data format conversion required to transfer supported file among different environments.

The spokesman said the product, dubbed a "universal file transfer network setting," allows users to use symbolic

Continued on page 72

Peer-to-peer protocol debuts

By John Stepanow

IRVINE, Calif. — Origen Group, Inc. has announced the Origen SNA/3 Peer Communications Facility, said to implement fully IBM's System Network Architecture (SNA) peer-to-peer communications protocols Logical Unit 6.2 (LU6.2) and Physical Unit 2.1.

The protocols enable microcomputers, minicomputers, mainframes, terminals, file servers and other devices to exchange information directly rather than going through a central host, the company said.

The networking facility was written in C under AT&T's Unix System V and was developed in conjunction with Apple Computer, Inc. The package requires no external hardware and is being distributed at OEM and value-added resellers. Apple, the first licensed customer, is using the product to connect indirectly to its Macintosh micro-

computers with an IBM System/36, according to a spokesman.

Origen President Paul Kampel maintains his product is the first third-party product to offer full implementation of the IBM SNA 4.3 and 2.1 protocols, which many believe will become the industry standard for passing data between unlike computer systems. "These network protocols have been identified by IBM as a point of convergence for all its equipment, and no hardware vendor will be able to ignore it," he said. "Companies that implement the LU6.2 standard first will be way ahead of the game."

Kampel maintained that his product helps provide a missing capability of Unix System V — advanced networking capability. "We have a distinct advantage in the Unix marketplace," he said.

Continued on page 72

Few MIS execs manage both voice and data functions

Poll shows most firms expect no integration

By Paul Kamenetzky

The MIS manager who oversees both corporate data and voice communications functions represents the exception rather than the rule.

That was a finding from a Computerworld survey sent to a random sampling of subscribers in July. The 1,000 surveys were mailed with a dollar incentive, and 424 readers replied.

The survey found that a slight majority of companies separate departments manage voice and data communications (see chart). Few of the companies that manage the two functions plan to integrate the two functions (see chart).

As one may expect in companies where the two functions are split by

department, the MIS manager rules data communications. Close to 80% of the companies listed data communications as the responsibility of the MIS department. Less than 2% said a communications department was responsible for data communications.

In the cases where voice and data functions were split, the department overseeing voice communications was less clearly defined. In 36% of these companies, the director of operations or administrative services supervised voice communications. Other titles mentioned were vice-president, assistant vice-president and telephone supervisor. In three out of four cases, these people worked in general administration.

Where voice and data functions are merged, two-thirds of the companies said the MIS department supervises both functions. In 30% of the cases, general administration oversees both functions.

Continued on page 70

AT&T adds microwave bypass

Having once said it wouldn't encourage users to bypass local telephone companies, AT&T has introduced two microwave bypass systems, an enhancement that will now be offered from the former Bell operating companies.

The **AT&T Network Bypass** option provides facilities that include a low- and high-speed system. The low-end Network Interconnection System Digital Radio 20 (DR20) is provided under a one-month toll-free pay-back contract by Digital Microwave Corp. in Santa Clara, Calif. It is a 20-MHz digital microwave system that requires a minimum speed from 1.544 to 0.512 Mbps. for up to 10 miles.

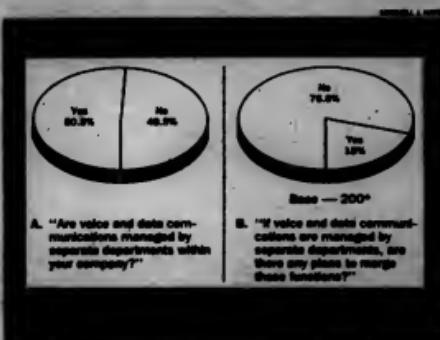
An DR200, DR400, or company-specific DR4000 is to be sold in T3 speeds — DR200 is said to be able to accommodate up to 64 digital channels, each operating at 64 Kbps/sec. The system's antenna can be installed on a roof or within an office, facing out a window.

Both the DR20 and its bigger brother, the DR40, provide point-to-point links for data or voice communications. The links can be used in common bypass applications, such as linking corporate facilities or linking a company directly to its long-distance communications carrier, thus eliminating the need for using the telephone company's local loops.

The high-end DR40, developed by AT&T Bell Laboratories and manufactured by AT&T's Network Systems Group, is a version of a system that AT&T has been selling to the divested Bell operating companies for their use or resale since August 1984. The system includes a 6-GHz digital microwave radio that transmits at 40 Mbps., or T3 speeds, at distances up to 40 miles, supporting up to 672 voice channels at 64 Kbps/sec.

AT&T reported that it would provide in-

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COMMUNICATIONS

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Few executives manage both voice and data

Overall, only 30% of the companies surveyed said their MIS managers also oversee communications responsibilities (see chart). In 65% of the companies, MIS and communications are ruled by different groups. Of these companies, roughly half have communications and data processing as peers, growing in the same department; the rest have MIS and communications reporting to different departments, with MIS typically re-

porting to finance and communications to general administration.

Interestingly, few companies reported they had a telecommunications director. Asked what the title of the person was that manages voice, more than 35% said director of operations/planning/administrative services. Only 12% said they had a telecommunications manager.

The survey also examined how local-area networks and private branch exchanges were used at these companies. These results will be printed in next week's Computerworld.

MIS/DP and communications are peer operations under a single executive	35.3%
MIS/DP and communications are separate operations in separate SVPs	30.5%
Communications is under MIS/DP	29.8%
MIS/DP is under communications	1.0%
Other	3.4%
Total	41.6

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COMPUTERWORLD

E X T R A

COMMUNICATIONS

From page 57

Peer-to-peer protocol debates

Physical Units are used to describe types of devices used within an IBM SNA-type network. Equipment based on the Physical Unit 2 standard can only address IBM 370-based architecture in a hierarchical master/slave relationship. The Physical Unit 2.1 emulation enables peer-to-peer communications between a range of systems, including System/36 minicomputers and System/38 superminis, IBM 6500 OS/VS Administration Systems, IBM Displaywriters and IBM Scanners.

Although Physical Unit 3 supports only a single communications link and one logical session per link, Physical Unit 2.1 can support up to 512 concurrent logical links, enabling

that number of users to share the expense of a single physical cable.

"We don't think hardware, storage or the operating system are the constraints today. The constrained resource today is access to data," Ransped said. He noted that microcomputer board manufacturers can put the Orion software onto chips, and developers of local-area networks can use the facility as a gateway to connect two nets.

The principal advantage of LU6.2 is its accommodation of intelligent, low-cost network devices. "The LU6.2 network design recognized this by permitting any device to talk directly to any other device without intervention."

The company offers its SNA/2 Peer Communications Facility on a license and royalty basis.

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If you're about to sign a purchase request for a non-Wall Data protocol converter, it would be in your best interest to throw your pen toward some non-populated area of the office. Trust us. You can retrieve it after you've read this ad.

You have all these ASCII minicomputer terminals and personal computers. Right? And you want them to be able to communicate to a host mainframe or a System 34/36/38, some perhaps over phone lines, in SNA/SDLC, E/SYNC, etc. Right? And you've done your homework. Right?

Then ask yourself the same five questions your management and staff are guaranteed to ask you over the lifetime of the product. Over and over again:

1. Can you handle multiple, concurrent protocols to multiple hosts? Not unless your protocol converter is from Wall Data.

2. Is your data secure from unauthorized outsiders who dial in? If your protocol converter doesn't ask for a user's ID and then hang up and call back to the authorized phone number for that user, you're asking for trouble. Why not ask for Wall Data?

3. Can you just download protocol software when new protocols become available? Or when software enhancements are made? You can't with the others.

4. If you suspect there is a problem with either the system software or a data line, can you dial into the protocol converter's console port and do remote diagnostics? Yes, but only with Wall Data.

5. What is the price? Actually, it's quite high...if you aren't dealing with Wall Data. For all the above reasons. Plus the obvious fact that Wall protocol converters are the market price/performance leaders.

Wang rolls out TMX facility

Wang Laboratories, Inc. of Lowell, Mass., has announced the Wang Telephone Message Exchange (TMX), an operator-assisted communications directory for telephone messaging and directory services. The product features 24-hour telephone message retrieval without operator assistance.

With the Wang TMX, a telephone call is forwarded from a person's telephone to a Wang TMX Message Delivery point. The operator's message station, a Wang Professional Computer linked to a Wang 5M minicomputer supporting Wang Office Software, displays a personal profile created by the called party. The operator uses the profile to give a customized response and appropriate information, such as a relayed message or alternate contact.

The caller has the option of leaving an electronic message in the user's Wang Office mailbox, forwarding the call to a designated telephone or directing the call to the Wang DVX voice mail system for the caller to leave a personalized voice message.

The Wang TMX permits notification and retrieval of messages from any workstation in the Wang Office network. Wang Office messages can also be sent to a printer from a workstation or push-button telephone, according to the vendor.

The Wang TMX package consists of hardware and software for the Wang VB and Professional Computer. Hardware requirements include a VB with 32M bytes of main memory and a minimum of 147MB bytes of disk storage, Wang Office software and a Wang Professional Computer with 640K bytes of memory.

The Wang TMX package will be available in the U.S. in the first quarter of 1986. The Professional Computer portion of Wang TMX costs \$5,500 per workstation. The VB portion costs \$600 per VB processor for a stand-alone system and \$1,500 per VB processor when integrated with Centrex or the Meridian SL-1.

From page 57

Communications tool for file transfer bows

file names rather than learn specific vendor file naming and attribute conventions. It features interactive facilities for users to enter simple transfers for requests and more complex sequences where request dependencies are required.

SNE File Transfer also allows a data processing professional to implement procedures in the product that automatically refresh file inventories within information center processors from production systems.

The system, which runs on an IBM VM application under MVS, supports IBM RACF security software and other Wang and DEC security systems.

The Software Research spokesman said that future releases in the SNE line will include electronic document interchange capabilities and support for IBM's VM, both of which are slated for release in the first quarter of 1986.

SNE File Transfer is currently available. The initial license fee is approximately \$17,500 for an MVS host, \$6,000 per minicomputer and \$400 per personal computer.

From page 57

AT&T adds microwave bypass systems

dividual components, such as stand-alone radio products, or complete engineering, installation and maintenance. Options include local remote alarms, centralized maintenance, host security protection, power options and signal encryption.

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DBMS vs. data base machine

Despite advances, the technology of software data base management systems has its problems. These problems include excessive overhead and limited performance. A software DBMS consumes a significant portion of the resources of a general-purpose computer.

For example, software which many users access at the same time will increase the information required from the system, calls for data relationships different from those originally defined for the system. Although the relational DBMS is much easier to use than its CodASYL counterpart — reducing both initial program development costs and long-term maintenance costs — the flexibility of the relational DBMS is appreciably slower. This is due to a fundamental mismatch between the architecture of CPU designed for the sequential execution of algorithms and the architecture required for data management. Data management is inherently a parallel activity.

In other words, the general-purpose processor is asked to do something it was not designed to do.

Data base machines attempt to overcome the deficiencies associated with conventional architecture by using a special-purpose, functional architecture designed to handle different functions of data management simultaneously. They are used as back-end machines, freeing the host computer to perform the tasks for which it is best suited, and as data base servers in a collection of networked workstations or cluster microcomputers.

The data base machine is one of two major categories of data base processors. While the data base machine offers all DBMS functions, the I/O off-load processor, the other category, is limited to the physical retrieval of data. The I/O off-load processor system does not offer DBMS, data dictionary or nonprocedural facilities.

The data base machine places the data base management function on a separate processor with exclusive access to the data base. The host machine collects data management requests and transmits them across an interface.

Continued on page 82

Nguyen is a specialist in information systems technology and information movement and management for the U.S. Air Force assistant chief of staff for information systems.

Single-vendor service

MIS execs report growing interest in concept

LEXINGTON, Mass. — The single-vendor service concept, where one vendor maintains all of a customer's equipment regardless of the manufacturer, is of increasing interest among management information systems directors, according to the Ledgerway Group, a market research and consulting firm.

In a recent telephone and mail survey of MIS directors in Fortune 1,000 firms, Ledgerway found a growing interest in having a primary vendor maintain either or vendor equipment, according to Ledgerway managing director Richard C. Munn. Ledgerway noted that 45% of the surveyed MIS directors indicated that they might be interested in the single-vendor concept. That 45% figure was obtained by combining the 15% who said, "yes" they would consider single-vendor service, and the 31% who answered "maybe" to the same question.

Munn said the most common benefits cited in connection with single-vendor service were elimination of finger-pointing among vendors and better coordination of diagnosis and repairs.

In addition to increasing interest among customers, the single-vendor service concept is gaining popularity among vendors, according to Munn. Among these vendors, the idea receiving "considerable attention" is that of having a single vendor act as the customer's service manager. Munn said that in such a role, the single vendor is responsible for fault diagnosis and isolation, repairing or managing a subcontractor making the repair and areas such as service contract administration.

But Munn noted that the service manager concept is less popular with customers who prefer having their primary vendor service all equipment.

He also cited two surprising findings of focus groups conducted in conjunction with the survey. These groups, one with customers and another with district and branch service managers, re-

Continued on page 84

■ Free exchange of information between systems is the key to true computer-integrated manufacturing/T9

■ Honeywell Information Systems will offer Storage Technology tape drives on its mainframe products/S2

Off-site storage protects data



BRIAN TALKE
Donna Raimond
Gene Raymond

Information is an important — a revenue source in labor, capital and raw materials. As users begin to accept the need to protect their data, they would be wise to investigate storing copies of their magnetic media in safe places.

That is the advice given by Nagleid Weller, president of National Safe Depository in San Jose, Calif., in a paper titled "Off-Site Data Storage: A Changing Industry."

Although Weller is president of a storage company and, therefore, has a vested interest in how people store their information off-site, it is worth listening at his views. The many companies still trust the Fates to keep their data safe and feel that they need not participate in disaster planning.

Information is one of the most frag-

ile, volatile and easily destroyed of all corporate assets, and yet it is among the easiest of resources to preserve. Management can quickly calculate the cost of hardware and software, but few can state the value of their data base.

A key element in disaster planning and management should be an off-site storage program for one — or preferably two — sets of duplicate backup records, Weller advised. Off-site storage costs less than on-site storage, he said. He pointed out that the average storage account costs \$300 to \$300 per month, while a single in-house security guard could cost \$1,000 per month.

The odds of a company's data base being destroyed decrease dramatically if the data base is stored in two or three locations, the paper said. One common yardstick for how far off-site that storage should be is that data should be retrievable in two to four hours. This criterion varies from company to company, but most companies

Continued on page 81

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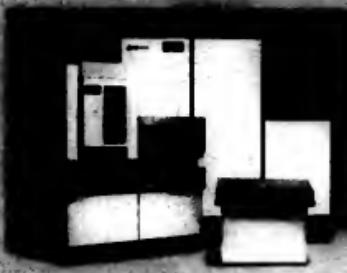
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True CIM hinges on information link between systems

By Sheila L. Cotter
and Charles S. Skinner
Special to CW

True computer-integrated manufacturing (CIM) will not become a reality until manufacturers can freely exchange detailed product, manufacturing and other information among a variety of systems, be they computer-aided engineering (CAE), design and manufacturing or others.

For example, product data is needed to perform numerous manufacturing tasks such as numerical control equipment programming, process planning, tool design, production planning and control, quality control and assurance and the like. Similarly, manufacturing data is required by the engineering/design function to achieve cost-effective products.

The information link between CAD, CAE and CAM systems, unless on a system purchased from a single supplier, is still maintained largely with paper documentation using engineering drawings. This method requires a great deal of product definition interpretation. Automating this link requires a common product description that can be characterized by the following:

- Complete from a manufacturing as well as a design perspective.
- Usable by all the applications that need product data.

■ Understandable by both people and the computer.

Issues to resolve

Even though the CAD marketplace is substantial, growing and includes some powerful key players, it has some fundamental issues to resolve:

- Failure to capture all product definition data needed for manufacturing and other functions of the enterprise.

- Inconsistent product information formats.

- Lack of compatibility of CAD equipment and software supplied by a variety of manufacturers.

Role involved

Committing to a single supplier for one's CAD/CAM systems to achieve compatibility and integration is fraught with risks:

- The supplier may not continue to offer the most cost-effective systems available.

- Systems from a variety of suppliers may be required to meet a broad array of needs by numerous units of

the enterprise.

- Compatibility of multi-supplier CAD and CAM systems is required for the enterprise to interact effectively with customers and vendors.

Taking CAD systems as a case in point, communications between dissimilar systems are made possible through compatible network-

ing and a common language like IGES.

Booz, Allen & Hamilton, Inc. conducted a nine-month study to test 13 different vendor and user-developed IGES translators to determine the degree of compatibility between dissimilar CAD systems and thus the quality and level of implementation of the IGES standard.

The effort was performed under McDonnell Douglas Automation Co.'s Product Definition Data Interface project funded by the U.S. Air Force.

Based on these tests, which did not exhaustively examine every aspect of IGES but did provide an in-depth evaluation of its implementation, problems were found

with both IGES itself and with the translators developed by the suppliers and users. At the time of the tests, the participant had completely implemented an IGES Version 1 pre- and postprocessor. There was widespread general success in implementation of wire-frame geometry and annotation, but not of sur-

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Cotter is an associate, and Skinner is vice-president for Booz, Allen & Hamilton, Inc. of Cleveland.

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SYSTEMS & PERIPHERALS

From page 72

Off-site storage protects information

Want access as quickly as possible.

According to Weller, storage customers should be aware that if data is stored in an on-site vault, the vault may remain intact in case of a fire, but the contents could be destroyed by heat. Buildings that have suffered fire, flood, earthquake, smoke or toxic gas damage are sometimes closed by health or fire authorities for several days — or even weeks — after a disaster, Weller said.

Del Monte's experience

That was the case with Del Monte Corp. in May 1985. The \$3 billion food processing and distribution company's users were completely cut off from their in-house data system for eight days that month when a transformer blew, leaving the system intact but also leaving the threat of chemical contamination that made health authorities close the building.

The threat of damage by a company's employees should also be considered, according to Weller. Human-caused catastrophes include vandalism, arson, riot, strikes, sabotage, accidents, oversights and human error.

A company should undertake a careful risk analysis that identifies and measures the economic impact of various risks, Weller said. Management should ask the following questions:

■ What will it cost if certain data is lost?

■ How long can the company be closed, in whole or in part, without threatening its ability to survive?

Records should be classified by order of their importance to the

company, Weller said. Critical data should receive off-site storage backup.

Noncritical data — data that can be regenerated if needed at a cost that is less than off-site storage costs — can be backed up on site in a way that keeps it protected as much as possible.

In selecting a backup site, companies should do the following:

■ Visit all available sites within a chosen area, eliminating storage companies that will not allow a tour of their facilities.

■ Check out the site for fire protection, climate control protection, access and delivery services.

■ Meet the people who run the business and make sure you are comfortable with them.

■ Obtain references from present customers.

From page 72

True CIM relies on data link between systems

face and structure. Most were generally successful in dealing with the data forms and translating the text cases.

Even though most of the identified problems were specific to certain sites, there were some generic issues that required future resolution.

Wire-frame, two-dimensional and three-dimensional geometry has been successfully implemented because it is similar to and adequately replaces engineering drawing product design information. As a result, many CAD users are content with this well-developed aspect of Iges, thus minimizing the pressure on suppliers to develop more difficult surface representations.

Furthermore, Iges is not truly neutral in that it was based on early commercial CAD systems representations. Systems substantially different from Iges have greater difficulty processing some Iges entities.

Several development needs were identified from this survey that are key to achieving CIM. Many boundary representation solids are still approximations not suitable for numerical control programming because of product precision requirements.

There is a clear need for greater integration of shape and message data structures and a definition of manufacturing data in computer-understandable form. The interface needs to be defined. And, finally, product definition data formats need enhancement, and a single format needs to be agreed upon as an international standard.

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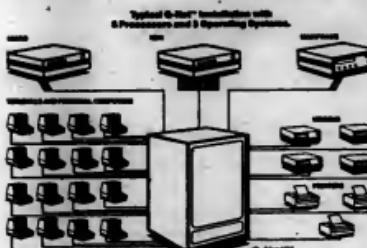
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From page 72

Single-vendor service concept growing in MIS

revels that there is a degree of skepticism of single-vendor service and a feeling that the operations staff may be threatened by such coverage. The groups also showed that there is "considerable cooperation between service personnel representing different vendors at the local level." Munn theorized that that cooperation stems from the service representatives' allegiance to their craft and a desire to avoid wasted time.

Munn noted that companies including AT&T Information Systems, Control Data Corp., and Digital Equipment Corp. have introduced single-vendor service and that other companies are offering such service on an ad hoc basis.

"This is a very difficult service to offer and realize, but there are a number of risks for any service vendor considering these concepts. At the same time there are opportunities to expand the range of services offered and certainly help gain more control over an account. As vendors expand and promote these services, there will be much greater competition for third-party service companies, and many smaller vendors will be relegated to subcontractor roles," Munn said.

The study, "Service in a Mixed Vendor Environment," and videotapes of the focus groups is priced at \$2,750.

SYSTEMS & PERIPHERALS

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DBMS vs. data base machine

Fact to the data base machine. Status and results are accessed from the data base machine by the host and sent to the appropriate application programs.

The more a data base machine does in off-loading work from the host computer the better. However, there is a limit. The host machine should handle query translation, end-user facilities support, terminal communications, scheduling, formatting of user output data, system integrity and security and application logic.

The benefits of using a data base machine include the following:

Host independence. A data base machine can interface with a wide

range of machines.

Flexibility. When expansion or upgrading is needed, the data base machine is more economical than the next larger computer.

Performance. The architecture was designed to perform only data base management functions, so data base machines can perform data base operations much more quickly than a host computer can, and less powerful hosts can support required levels of response.

Shared data base. Many different computers can share the same data base.

Off-load host or isolation of DBMS overhead. Data management requires large programs and consumes a large percentage of a host computer's capacity. Moving the work into a data base machine frees the host to perform other tasks.

Reduced cost. Data base machines cost substantially less than the hosts they off-load. Also, the intangible costs of a mainframe system's resources can be added to the tangible costs of a software DBMS, while the data base machine can support multiple hosts without duplicating peripheral equipment.

Efficiently supported relational models. Relational data bases are powerful and flexible but are slow performers and heavy users of computer resources. Data base machines can efficiently support the relational model.

Security. Data base machines provide a second level of security control.

Speed. The processing speed of data base machines is limited only by the speed of the secondary memory.

Central control. In a net envi-

ronment, the data base machine provides a central data management facility. Several computers can share access to data stored on the data base machine. Security, recovery control and protection functions are implemented within the machine.

Improved recoverability. As the data base management functions are separated from the host, the recovery of these functions becomes feasible without impacting the system.

Modularity. The separation of functions enhances the concept of modularity through the system and translates to future growth by data base sharing through multiple machines.

In some cases a host processor must be connected to multiple data base servers, and, since many installations already have host processors interconnected on a local-area network, the data base machine should be connected in this environment.

To accomplish this, local network hardware must be standardized, since data base machine designers and manufacturers cannot afford to offer interfaces for more than a limited number of network types. Fortunately the Institute of Electrical and Electronics Engineers, Inc. is making progress in local-area network standardization.

The second level of standardization requires standardization of the communications protocol used by the host processors to communicate with the data base machine over the local-area network. For the U.S. Department of Defense, even with TCP/IP as a base, a higher level protocol — an application protocol — will be needed for standardization.

Specifications, development and adoption of such protocols by data base machine vendors will provide tremendous flexibility in purchasing and using data base machines.

There are several data base machines now, or soon to be, in production. These include the following:

• The Transdata Corp. DBC/1012.

• The Valence data base machine being built by Ordain, Inc.

• The IDM-500, built by Britton-Lee, Inc.

• Data base machines being built

in other countries. There are two

projects in France, two in Japan, one

in West Germany, one in Italy and

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STC to supply tape subsystem to Honeywell

In a \$15 million, multiyear OEM agreement, Storage Technology Corp. (STC) of Louisville, Colo., has contracted to supply tape subsystems to Honeywell Information Systems, Inc.'s Large Computer Products Division in Phoenix.

Under the agreement, STC will supply Honeywell with its 4600 series Pipex tape subsystems, a 300 in./sec. dual-density 1.65 and 6.3K bits/in. recording formats. Introduced in 1983, the 4670 features an optional 3M bytes/sec. throughput rate.

A Honeywell official said the tape subsystems will be available in early 1986 with Honeywell's DPS 8, DPS 88 and DPS 90 systems.

COMPUTER INDUSTRY

Giants not ready for war

By Paul Karpashevich

NEW YORK — Before AT&T and IBM can begin to compete directly, both must overcome challenges evident in the traditional markets each has dominated.

Archie McMillan, who served in executive positions at both companies and is now president of Rothchild Ventures, Inc., a New York investment firm, made that claim recently at "IBM — AT&T, New Technologies, New Directions," a seminar sponsored by the New York-based market research firm, Eastern Management Group.

Even if both companies do make the necessary moves, head-to-head competition will not take place until 1990, he said, adding that analysts have underestimated how much effort is needed for either company to forge a presence in the other's market.

A primary challenge that IBM faces is that mainframe sales have peaked and are now the slowest growth area in the industry. "I expect that the 3000 series announcement will increase IBM's mainframe sales, but sales will not grow more than 7% a year," he said.

Users are confused by changes in the industry and are looking to companies like IBM for answers, but the big companies have failed to deliver on promises, he said, citing IBM's yet-to-be-introduced local-area network.

Many analysts have praised the purchase of Rolm Corp., but McMillan claimed that IBM will have problems digesting the communications company. "IBM will need a few years before it realizes a profit from that acquisition," he claimed.

Rather than purchasing companies, McMillan predicted, Big Blue will enter more joint marketing agreements like those inked with MCI Communications Corp., Stratus Computer, Inc. and Bytex Corp. "Not even IBM has the breadth to compete with all companies on all fronts," he noted.

AT&T, on the other hand, faces the most complex and complicated challenges in the history of American business, according to McMillan. "The company has to change revenue and profit streams that have existed for more than 100 years," he explained.

Compounding the problem is that every one of AT&T's revenue streams is under pressure. The

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'Fit' vital in buy-outs

Acquisitions should complement strategy

By Clinton White

NEW YORK — The most successful corporate acquisitions are motivated by strategic rather than financial considerations, according to an executive of one of the most active corporate buyers of software and services firms during the last five years.

Peter Lesser, director of acquisitions for Dun & Bradstreet Corp., told a recent industry forum that regardless of how attractive the cost of a potential purchase may be, financial issues should only be considered after assessing the strategic fit of the buy-out candidate.

"Understand the dynamics of the market you're thinking about entering — who's gaining market share, who's losing and the position of the acquisition candidate," Lesser said at the As-

sociation of Data Processing Service Organizations, Inc.'s (Adapso) annual seminar on merges and acquisitions activity in software and DP services. "The company to be acquired must fit the acquirer's profile in marketing, product direction, operations and, most difficult to assess but perhaps most importantly, in management characteristics."

Lesser noted that Dun & Bradstreet, after making 33 acquisitions during an 18-month shopping spree, including McCormack & Dodge Corp., is now trying to build on its existing businesses rather than continuing to diversify.

Considerations to assess the proper fit, Lesser said, include the current and potential product and geographical overlap in marketing and the potential for sharing technological resources. In market position, the most likely software and services acquisition candidates have small to medium

Continued on page 82

Tandon finally lost a round to a foreign disk drive manufacturer before the International Trade Commission, but the company said that skirmish was moot and looked ahead to a pending antitrust action.

■ Digital Switch was awarded a major contract by one of the first Japanese companies to go into competition with the Nippon Telegraph and Telephone giant. ■

■ Toshiba's first operating loss in 10 years, Advanced Micro Devices said it will try and spark the depressed chip market by introducing a product each week beginning in October/91.

Global-Ultimacc looks ahead

By Peter Bartels

The management team at Global-Ultimacc Systems, Inc. gained a new lease on life recently when the U.S. Bankruptcy Court in Denver approved the sale of Storage Technology Corp. (STC) majority ownership in the firm.

Charles J. Stevert, chairman of Waldwick, N.J.-based Global-Ultimacc and one of the firm's company executives who brought out STC, said Global-Ultimacc to remain profitable by the end of the year.

"The major change, and we've already seen it happen, is the perception in the marketplace," he said. "Customers are no longer concerned about us being pulled into bankruptcy; technically, STC could have done it any time.

All they had to do was call their debt."

Global-Ultimacc absorbed the customer base and field engineering force of bankrupt Magnus Computer Systems, Inc. and markets IBM 4300 plug-compatible systems and turnkey systems. Stevert said the company hopes within weeks to be able to announce an OEM agreement providing a next-generation processor but said he could not provide details until the deal is finalized.

After watching revenues almost double in 1984 to \$25 million, the company was essentially left out in the cold when STC filed for reorganization protection last winter. The situation was critical because Global-Ultimacc depended exclusively on STC for most

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Adapso winning Pyrrhic victories?



INDUSTRY INSIGHT
Peter Bartels

Let's face it, sometimes industry lobbying groups get carried away with the thrill of victory and neglect to consider the seeds of discontent that could someday lead to the agony of defeat.

A case in point — the Association of Data Processing Service Organizations, Inc. (Adapso) is the latest victim of its newsletter, "Adapso Data," which begins with the headline "Adapso victories on California warranty bill."

The text thereafter went on in more humble terms to explain that "due in large part to Adapso's coordinated opposition," a California Assembly committee suspended any action on AB 1507. That bill, for those who haven't been following the revolutionary actions of its sponsor, Assemblywoman Gloria Molina, would have

Adapso explained, "dramatically changed the relationship between buyers and sellers of computer hardware and software by prohibiting the disclaimer of implied warranties while requiring developers to provide a refund or replacement if a product did not meet users' expectations."

Forish the thought that the seller of a product should be required to actually deliver on his promises.

Here's a typical disclaimer, taken from a Microsoft Corp. package, of the type that Adapso is so committed to preserving: "The program is provided 'as is' without warranty of any kind. The entire risk as to the results and performance of the program is assumed by you. Should the program prove defective, you (and not Microsoft or its dealers) assume the entire cost of all necessary servicing, repair or correction (emphasis added). Further, Microsoft does not warrant, guarantee or make any representations regarding the use or the results of the use of the program in terms of correctness, accuracy,

Continued on page 93

Major lessons shun Comlease

By Mauro McNamee

NEW YORK — During a year of waning trade show attendance, a group is continuing to entertain visitors, launching what it claims to be the first travel show on computer leasing.

But like many of the shows this year, next week's Computer Leasing Conference and Exhibition (Comlease) seems to hitting a period of vendor apathy. Some familiar names, such as Citicorp Industrial Credit, Inc., Greyhound Capital Corp. and World Leasing Co., will be present. But Comlease will debut without the participation of several leasing giants, including IBM Credit Corp.; Comdisco, Inc.; Datavase Equipment, Inc.; and CMI Corp.

Show manager Ken Burroughs told Computerworld approximately 30 exhibitors have accepted booth space at the show, scheduled for Sept. 20 to Oct. 2, at the Marquis Hotel here.

An IBM Credit spokesman said Big Blue received information about Comlease after the com-

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Contracts key for clarifying software owner's rights

FOURTH IN A SERIES

By Jerome J. Roberts,
Matthew S. Pease,
and Michael P. Brownell
Special to CIO

A contract provides two indispensable elements in any software protection plan. It helps to define and specify the rights and duties arising from intellectual property law; it also provides a mechanism to create additional rights and duties, enabling the software owner to protect elements of software products not otherwise protected by intellectual property law.

Contract protection provides the glue to bring together all available protective tools into a comprehensive and cohesive proprietary protection plan.

Contract protection of software should be in writing, preferably signed by both parties. Written contracts should be used for any transaction involving the disclosure or development of proprietary software such as software licensing, software development projects, marketing and distribution arrangements, beta test site situations and employment and independent consultant relationships. Confidentiality agreements of a general nature can be utilized for miscellaneous circumstances in which proprietary information is to be disclosed.

The presence of a written agreement does not automatically ensure adequate contract protection of the relevant software proprietary interest. Often, unfortunately, such contracts fail to allocate the parties' respective rights and duties relative to important proprietary rights issues. Without contractual guidance, such issues will be resolved by statutory and/or common law principles, often yielding uncertain, unexpected and undesirable results.

Roberts, Pease and Brownell are attorneys with the law firm of Sherman, Roberts and Kelly in Chicago. The firm's practice deals with legal issues related to procurement, development, distribution, management and protection of computer resources.

Each software-related contract will present certain proprietary rights issues specific to it. Consequently, specific contractual measures necessary to protect software require a case-by-case analysis. The following, however, are some of the topics that should be addressed:

■ Proprietary materials should be defined as completely as possible. Such definitions often address the following considerations: the type of software element, for example, programs, documentation or report formats; medium of expression; for example, source code, object code, microcode; media

on which the software resides; and accompanying manuals and other documentation.

The definition should extend to all copies of the software and related materials made by the recipient, as well as to all software modifications furnished by the owner — and possibly created by the recipient. Finally,

the applicable proprietary rights existing in and arising from the software and related materials should be recited.

■ The respective rights and interests of the parties in the proprietary materials to be disclosed and/or created must be delineated carefully. In a software license, the

continued on page 85

"Why doesn't somebody make a graphics terminal you can change to fit different jobs?"



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COMPUTER INDUSTRY

From page 84

Contracts key in software smart

owner should reserve ownership and require the licensee to acknowledge the same. The issue of ownership may be a subject of debate in contracts calling for software development. In employment agreements, the employer should retain ownership of materials created by the employee in the course of his employment.

• The purposes for which the recipient is permitted to use the software must be defined clearly, and measures used to protect the owner's interests in the software should be specified. Restrictions on use, copying and disclosure of the software may be in order.

Examples particularly appropriate for the software license include the following: Use of the software should be limited to those activities reasonably related to the

purposes of disclosure; if copying is permitted, it must be limited to specific purposes and quantities, and all copies should contain the proprietary legends appearing on the original software or as otherwise directed by the owner; and the recipient should notify the owner upon suspicion of misuse.

• A provision should be inserted that requires the recipient to return or destroy the software upon the termination or expiration of the

purposes of disclosure.

• The recipient is often required to indemnify the owner against any loss or expense incurred as a result of the recipient's failure to comply with its proprietary protection obligations.

• The agreement should state that the recipient's proprietary obligations survive termination or expiration of the agreement for a specified time period or until the software ceases to be proprietary to the owner.

ITC drops Tandon's trade suit

WASHINGTON, D.C. — The U.S. International Trade Commission (ITC) recently dismissed Tandon Corp.'s unfair trade practices suit against South Korean disk drive manufacturer Gold Star Tele-Electric Co.

The ITC referred to its finding of Gold Star's unfair practices, upholding a previous judge's ruling that Gold Star did not violate international trade regulations by importing its 5 1/4-in., half-height, double-sided drives into the U.S. in 1984. But Tandon's related \$150 million civil lawsuit against Gold Star is still pending in U.S. District Court in Los Angeles.

An attorney for Chatsworth, Calif.-based Tandon said the ITC case had essentially been moot since December 1984 when Gold Star stopped importing the drives in question. But Gold Star spokeswoman Darlene Rabé said the ITC's ruling should help in the federal court case, in which Gold Star has filed counterclaims charging Tandon with abuse of process, antitrust violations, tortious and contractual interference and unfair competition. "The ITC ruling upholds what has been our position throughout the case," Rabé said.

The case stems from Tandon's allegations that the Gold Star products were based on technology stolen from Tandon by current and former Tandon employees. The employees helped to found now-defunct Formac, Inc. of Los Angeles, which manufactured the drives for Gold Star, according to Tandon attorney Raymond Lupo. Tandon also accused some of the Formac founders with sabotage and industrial espionage while they worked for Tandon.

The Gold Star case is not related to Tandon's pending case before the ITC and in federal court against several Japanese disk drive vendors.

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AT&T strong in large user mart, weaker on other fronts

NEW YORK — AT&T has defended and strengthened its hold on the large user long-distance marketplace but has not made significant inroads in other areas, according to a market research firm.

Approximately 1% of the communications company's customers supply AT&T with 40% of its revenue, according to Eastern Management Group of New York. The firm presented its analysis at a recent seminar titled "IBM and AT&T: New Directions, New Technologies," held earlier this month.

Most large customers have experimented with long-distance services from communications carriers such as MCI Communications Corp. John Malone, president of Eastern Management, claimed that eight out of every 10 of the Fortune 100 companies have some type of agreement with a carrier other than AT&T.

However, AT&T controls 96% of the market that consists of companies spending \$80,000 a month on long-distance calls. "Large companies tested services from vendors like MCI but have returned to the AT&T fold," Malone said. Poor service drove those companies back to AT&T.

Since divestiture, AT&T has entered a number of new markets. The company competes with Digital Equipment Corp. in the minicomputer

market, IBM in the personal computer arena, Ungermann-Bass, Inc. in the local-area network niche and foreign telephone companies. However, these moves have done little to increase AT&T's profits, according to Malone.

A better way for AT&T to improve its financial position would be by cutting costs, Malone claimed. A principal area to reduce costs would be in fees paid to former regional operating companies. AT&T is continuing to cut 60 cents on much long-distance dollar for access charges to the operating companies. "That 60 cents is money disappearing out the back door," Malone noted. If AT&T could bypass the local connection, it would

significantly cut costs.

Also, AT&T is paying the operating companies \$2 for each bill sent to AT&T customers. "AT&T has to be losing money billing residents who make few long-distance calls," the analyst noted. By taking the billing function in-house, the company could eliminate the \$2 charge.

AT&T does not have any avenues for rapid revenue growth. Eastern Management does not think that the private branch exchange market represents a great opportunity. "AT&T has done a better job selling its PBXs this year than in any other year and has increased its market share," he said. "But the rate of growth in the PBX market has declined and will

continue to decline."

In 1984, the communications company announced 100 products primarily directed at the computer industry. Despite the slew of introductions, sales from 35 or personal computers accounted for only 2% of AT&T's revenue. Malone estimated that AT&T Information Systems, which delivered most of these products, lost \$1.5 billion dollars in 1984.

The analyst concluded by predicting that AT&T will have to sharpen its focus on its communications services and choose a few markets to enter rather than competing on a number of fronts.

— Paul Koenigswald

TORCH THE BACKLOG

From page 83

Grants not ready for war

communications company is losing its market share in the long-distance market, which is growing at a rate of only 5% per year. The company could face severe cash-flow problems as it attempts to diversify its business, according to McGill.

AT&T has always been action oriented and would immediately announce products that were technical breakthroughs. In 1984, the communications company launched technically oriented product thrusts rather than marketing-oriented product entries.

"Technically, the SB line has some very nice machines," McGill noted. "Its problems are software and AT&T's inability to convince companies to write for the machine."

He said AT&T has added each positive step with negative consequences, pointing to the recent layoff of 24,000 employees. "The company knew in 1984 that such a move was needed," he said. "I don't understand why it waited so long to make it."

McGill also claimed the AT&T-Int'l. C. Olivetti & Co. partnership as a stroke of genius. "AT&T needed an entrance to foreign markets and Olivetti provided it," he said. Even though that was a good move, AT&T has not worked that or other partnerships to the fullest advantage.

McGill echoed the views of other analysts who claimed that AT&T needs an office automation partner like Data General Corp. or Digital Equipment Corp. to make inroads into large corporations.

For either IBM or AT&T to succeed, each must be able to throw away old methods of doing things and quickly adapt to new marketplaces.

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COMPUTER INDUSTRY

From page 83

'Fit' imperative in buy-outs

shares of a high-growth market. Companies with higher shares in growth markets are generally not for sale or are available only at a prohibitive price, he added.

The two most important criteria in evaluating a potential partner's financial future are cash flow/return on investment and earnings per share, Lender said.

Although Dun & Bradstreet has added heavily to its bottom line with acquisitions, other firms have been much less successful in their acquisitions. Heading the list of such companies is Control Data Corp., according to George Grodahl, a partner in Broadview Associates, the Fort Lee, N.J., merger consulting firm that

conducted the Adapco seminar. "CDC is the best example that the most important factor in acquisitions is how well you integrate them," Grodahl said. "For years, their acquisitions seemed totally lacking in focus. Now, they've come full circle and have a vice-president of investments."

The flurry of recent mergers and acquisitions activity in the software and services industry can be attributed to changing attitudes among entrepreneurs about selling their companies. "More and more often, selling your company is something you are still able to run it," according to Gilbert Muntz, a founder of Broadview. "Buying acquired has become a sign of success, not failure."

Within that context, however, the seller must realize the fundamental changes inherent in a deal, according

to Datatime Corp. President Gerald O'Connell, whose Wilton, Conn., turnkey accounting systems firm was recently acquired by Display Data Corp.

"There is a lot of opportunity on both sides, but remember there is no such thing as a merger," O'Connell said. "The fact is, you have sold your business. Don't be naive about that, or you'll be very disappointed."

Acquisition is rapidly replacing venture capital as the growth mechanism for privately held software and services firms, Broadview's Edward I. Metz said. "Five years ago, the typical start-up strategy of the business plan, three rounds of venture capital and then a public offering," Metz said. "Today, venture capital is much harder to come by, and you see far fewer initial public offerings."

From page 83

Major lessors shun Comilease

pany's annual trade show schedule had been set. Decisions to attend trade shows are often made up to a year in advance, the spokesman said.

According to Bob Bardage, senior vice-president of marketing at Comilease, one of the nation's largest independent computer leasing companies, a trade show for leasing was inappropriate for Comilease. "We do a lot of education seminars on our own, and we don't see the need to throw ourselves into a trade show," he said.

Bardage added, however, that the show could achieve some success. "It may be a very palatable opportunity for a small leasing company that may not have the ability to get their message across on a national basis, but I would question how many people would travel a long distance to go to something like this."

Dasenbach, Vice-President Tim Gagner said that although the concept of a leasing show was a good one, his company also passed up Comilease. "It would almost have to be done on a real large scale to make it worth our while," he said.

But scale is of no concern to Tom Martin, president of Computer Financial, Inc. and Comilease chairman. A show like Comilease is necessary, Martin said, because of the changing facets of the computer leasing industry.

"The responsibility for leasing computers traditionally falls within [DFP], whereas with other companies, leasing assets are the responsibility of the treasurer. There are a lot of things that users need to know," he said.

Martin said the slim showing of exhibitors could be attributed to the fact it is sometimes difficult to sell services at a trade show. "It's a hard concept to sell an intangible product in a booth," he said.

From page 83

Global-Ultimace looks ahead

peripherals and owed STC \$20 million.

That dependence may not last much longer, Siebert indicated. "At the present time our systems will include STC peripherals, but over time we will be shopping around for other vendors' products that are more competitive or better priced."

Siebert said the transaction added up to \$2 million. The management team put up \$300,000 for the stock, and STC received an additional \$1.5 million in cash accumulated by Global-Ultimace as repayment of the debt. "That's roughly five to 10 cents on the dollar, which is a pretty good deal," he said.

"We expect to continue the momentum we had going back in 1983 and 1984 prior to the STC bankruptcy," he said. "The bankruptcy impacted us greatly; there was the perception that we couldn't guarantee we were going to be around."

Joining Siebert in the buy-out were Thomas A. Nagy, executive vice-president of operations; Thomas A. St. John, executive vice-president of sales and marketing; Richard G. Snow Jr., vice-president and general counsel; and William O. Sweeney, vice-president of technology.

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COMPUTER INDUSTRY

OEM brings Mitsubishi back to court

By Dennis Kozlowski

BOSTON — Leading Edge Products, Inc. has again instituted court proceedings against its equipment supplier, Mitsubishi Electronics America, Inc., seeking to recover funds.

Leading Edge, which is an OEM for Mitsubishi products, requested that U.S. District Court find Mitsubishi Electronics in contempt of the court's order originally issued in February and modified Sept. 4. The order requires, in part, that Mitsubishi pay an adjustment to Leading Edge.

The two companies have been battling in the courts since Leading Edge charged Mitsubishi Electronics, a California-based branch of Japanese firm Mitsubishi Corp., with trying to cut off its supply of components in 1984 [CW, Feb. 25]. Mitsubishi was the sole supplier of the major components in Leading Edge microcomputers at that time.

According to a petition filed Sept. 8, Leading Edge charged that Mitsubishi had failed to pay them \$638,707 due to a yen adjustment. The adjustment was to offset the higher value of the yen to the U.S. dollar over a period of time.

The adjustment was ordered by the court to be retroactive to Jan. 1, 1984, Leading Edge stated. It further said that Mitsubishi had paid such a yen adjustment to its only other customer, Sperry Corp.

The petition claimed that Mitsubishi offered Leading Edge a yen adjustment effective Feb. 11; that the court-ordered adjustment clearly and unambiguously called for an adjustment retroactive to Jan. 1, 1984; and that Mitsubishi has conditioned payment of any adjustment on a business matter not related to the reason for the yen adjustment.

Returned products reportedly refused

According to Leonard Ross, senior controller for Leading Edge, his company returned some terminals and other products that were not covered under any court-ordered agreement to Mitsubishi, and Mitsubishi refused to accept the returned products. Leading Edge stopped payment on a delivery of other products in order to offset the cost of the returned products, he said. Mitsubishi is using that transaction as a basis for refusing to pay the retrospective yen adjustment to Leading Edge, Ross said.

A lawyer for Mitsubishi in Boston, Zachary Karol, claimed that the Sept. 4 order was a modification of the Feb. 11 order and therefore dealt only with orders subsequent to Feb. 11. Karol said that Mitsubishi never made payment of the amount of Leading Edge's stopped payment a condition of receiving the yen adjustment. He sent a letter to Leading Edge Sept. 11 asking for an explanation of why Leading Edge did not pay for the order that it did receive. "I suggested a payoff, but it was never a condition," he added. The response from Leading Edge was the petition to the court, with the letter from Mitsubishi attached to it.

From page 82

Adaptec winning Pyrrhic victories?

reliability, correctness or otherwise; and you rely on the program and results solely at your own risk." Mitsubishi does, however, warrant that the action disk be free of defects.

This is not picking on Microsoft, because the disclaimer is pretty standard on microcomputer software packaging.

Furthermore, the point of this column is not to further berate such disclaimer disclaimers, but rather to point out to software developers the benefits double standard they are holding customers to.

Adaptec has been in the forefront of efforts to combat the evil empire of software piracy. Don't be naughtily, the organization tells users —

any time you copy a program, you are stealing money from the developer, or, even in most cases, the company that bought the rights to the program from the developer.

Adaptec has weighed in heavily on the immoral and illegal aspects of buying and using their products of software for overpriced software packages that are often "new" products that really are approaching commodity status in terms of originality and usefulness.

Yet this same organization that wants users to hold the high moral ground hypocritically denies those same users any guarantee that the goods they are buying actually work and live up to company claims.

Let's go back to the disclaimer cited above: "Microsoft does not ... make any representations regarding the use of or the results of the use of

the program . . ." That is pure hell! Microsoft and every other vendor that buys advertising in uncertain terms make representations regarding what their products will do, why they are better than other products and so on.

So, before Adaptec gets carried away on the victory lap, let's not just sit back and think about what it is willing to give users in exchange for what it wants from users. Perhaps Adaptec members should point out in their disclaimers what states actually prohibit such claims. And maybe — I admit this is really a radical proposition — just maybe there are some leading vendors out there with the guts to actually back up marketing claims and promise users a full refund or replacement in the event of any dissatisfaction.

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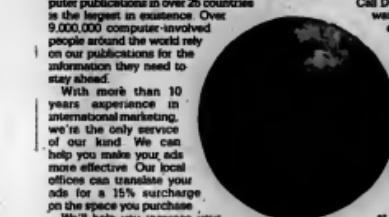
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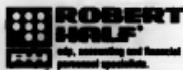
"It's easy to make good decisions when there are no bad options."
Robert Half on Hiring by Robert Half (Crown)

How to be more successful in your edp hiring.

Using a specialist will increase your success in hiring data processing personnel—and using Robert Half, the most experienced personnel specialist, will increase your chance of success even more. Here's why:

- You get highly personalized service from professionals who understand your edp needs.
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Enjoy living, eating, swimming, beaches, a Corrier and live atmosphere, and a professional climate that is very exciting. If you have any experience in MIS/Systems/Programmer, we would like to speak to you. Our client positions range from senior level through senior management. Send us your resume or call, and let DATA LINK introduce you to New England.

Our list of client companies is extensive, and all fees, expenses and relocation expenses are paid by our clients.

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DATA BASE ADMINISTRATORS/ANALYSTS

Immediate openings for data base administrators, analysts, and data base analysts. Duties include management of data bases and DBMS. Oracle and DB2 experience required. Excellent compensation and benefits package. Send resume to: Robert Half International, 1000 University Street, Seattle, WA 98101. No phone calls, please. Robert Half International is an equal opportunity employer.

Applicants must have DBMS or equivalent plus 2-5 years experience and proven technical skills. Send resume to: Robert Half International, 1000 University Street, Seattle, WA 98101. Robert Half International is an equal opportunity employer.

DATA BASE ANALYSTS
Immediate openings for data base analysts, analysts, and data base analysts. Duties include management of data bases and DBMS. Oracle and DB2 experience required. Excellent compensation and benefits package. Send resume to: Robert Half International, 1000 University Street, Seattle, WA 98101. Robert Half International is an equal opportunity employer.

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P.O. Box 5128, Division A
Huntington, AL 35054-5128
800-447-9444

POSITION ANNOUNCEMENTS

**DATA
PROCESSING
PROFESSIONALS**

DATA RESOURCE CORPORATION, headquartered in Atlanta, is seeking individuals who desire to work in a dynamic environment. This P/T position requires excellent DBIS and COBOL skills and the ability to travel or relocate.

Computer and Contract Programmers, Analysts and Testers for the following areas: DRC offers competitive salaries including bonuses and overtime pay. If you are interested for a growth opportunity with a dynamic company, then you are in the "right place at the right time." DRC is now hiring. Send resume to: 3300 Peachtree Rd., Suite 102, Atlanta, GA 30339, AT&T TELNET or FAX to WALLS at 404-455-7266 or toll free 1-800-343-0802.

DRC
DATA RESOURCE CORPORATION

**Technical
Support
Representatives**

IntellCorp, a leading supplier of software solutions for the financial services industry, is seeking Support Representatives.

Your responsibilities will include telephone handling and answering questions of our clients in an efficient and professional manner.

Our fast-paced environment requires strong communication skills with customers, clients and management. Other qualifications include a college degree in a related field, or equivalent experience. We offer excellent compensation, benefits, relocation assistance, and the opportunity to be a part of a well-established, highly regarded company.

Please send your resume and salary history to: Personnel Dept., TEC/IntellCorp, 11975 B. C. DeLong, West, Mountain View, CA 94034-2216.

IntellCorp
Equal Opportunity Employer

**DIRECTOR OF
INFORMATION SYSTEMS**

New Mexico Institute of Mining and Technology is seeking a Director to administer its information systems. The Director will be responsible for the planning, development, implementation, and maintenance of the University's information systems. The Director will be responsible for the development and implementation of a strategic plan for the University's information systems. The Director will be responsible for the development and implementation of a strategic plan for the University's information systems.

The successful candidate will possess a degree in computer science and relevant experience in business systems analysis, design, implementation, and maintenance. The Director will be responsible for the development and implementation of a strategic plan for the University's information systems. The Director will be responsible for the development and implementation of a strategic plan for the University's information systems.

Our compensation package is excellent, including a competitive salary and comprehensive benefits. Send resume and salary history to: Director of Information Systems, New Mexico Institute of Mining and Technology, 800 University Boulevard, Socorro, NM 87801. An Equal Opportunity Employer.

No one knows the data processing industry better than we. We have direct experience in banking, insurance, and the financial services industry. We have demonstrated over 11 years as an exceptional source of information for the financial services industry. We offer challenging opportunities for programmers, analysts, and systems professionals, with IBM, Sun, VME, and VAX mainframes. If you're interested, it's a good time for you to take that big step we can offer you.

To commercially support challenging new career opportunities contact us. We're the best.

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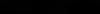










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POSITION ANNOUNCEMENTS

ALLSTATE SPECIALISTS

Southern California

Northrop Advanced Systems Division, dedicated to advancing technologies and resolving complex challenges to America's defense, offers new opportunities within our Computer Systems Department for Database Specialists.

These highly visible career-level positions involve the acquisition and implementation of major manufacturing and business systems. You will help us continue network and relational database technologies with personal computers and an information center to satisfy operational and management requirements.

Your technical background will qualify you for these rewarding openings. If it is more your interest in systems administration, data modeling, DBMS systems installation and tuning, ADOS application development, and prototype base development methodology.

Relocation assistance is available.

Northrop provides our employees a competitive, comprehensive benefits package. Please send your resume to: Bill Hargan, Computer Systems Employment Office, Dept. CW 782, N.O. Box 1126, Plus River, CA 95946-9872. **PROOF OF U.S. CITIZENSHIP REQUIRED.** Northrop is an equal opportunity employer M/F/V/H.

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NORTHROP

Advanced Systems Division
Aircraft Group

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A sophisticated IBM shop, hands-on assignments, responding applications, long-term growth potential, generous pay and benefits. All told, when it comes to DP careers, Allstate has it all.

Addictive is one of the nation's largest insurance companies. Our technical environment offers opportunities for growth including IBM, VAX, VME, and PC systems which operate on minicomputers and mainframes. And as we continue to grow, we seek professionals in the following areas:

TECHNICAL LIAISON

The candidate will act as liaison between our Computer Systems Department Division and the Acceptance Testing group. Responsibilities include technical maintenance of the acceptance testing environment, development of additional testing tools and techniques, plus the maintenance of a technical support database. 3-6 years experience in a technical support capacity required. Also, knowledge of IBM/VAX, C/C++, VMS, COBOL and basic ASSEMBLER language required.

PL/I & ASSEMBLER APPLICATION PROGRAMMERS

These positions require 2-4 years experience in a large IBM mainframe environment utilizing PL/I or ASSEMBLER. You should possess good TSO/SPF and JCL skills and have solid communication skills. COBOL is helpful.

Allstate offers an outstanding compensation package, a highly competitive benefits program, an excellent benefits matching Life/Health Group Insurance, 401K, Plus, Pension and Profit Sharing, Sears Discount, Sears Stock Plan, and much more. If you're ready for an all-around better career, you're ready for Allstate. For consideration, send resume with salary history or call:

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If you're a motivated professional interested in pursuing new career directions, investigate these exciting opportunities at Liton Mellonics. We have a 24-year record of excellence and a variety of challenging systems development projects ranging from stand-alone task performance through complex systems implementation.

Systems Engineering

Concept engineers are available to top level professionals to broaden your base of expertise while working on diverse projects for military logistics, satellite command and control and integrated systems.

Senior Database Analyst

From initial definition of requirements through physical implementation, your expertise will guide the database design process. After obtaining requirements from functional specialists, your design and implementation skills will be used to create and maintain database models. Your ability in this area is vital. Your control and dissemination of all phases will ensure the implemented database design meets our high standards for performance, reliability and integrity.

For years computer data systems development experience, including 4 or more years involvement with various types of large database design required, along with a B.S. in Computer Science, Math, Physics, Engineering or related discipline, with 10 years experience in data processing, 5 years in high-level programming languages (Fortran, Basic, and Boron, etc.), relational/normalized/normalized/other having database structure highly desirable. Database design work in a distributed systems environment a plus.

Senior Systems Analyst

You'll define requirements for large data systems based on analysis of customer documentation and information obtained through interviews. Gathering design requirements from functional specialists (on software and hardware) and defining requirements will be key. This involves developing functional descriptions, data flow and component block diagrams, and reviewing and documenting the design. 10 years experience in data systems development environment, including 4 years of requirements analysis and large data system design. B.S. in Computer Science, Math, Physics, Math, Engineering or related discipline, with 10 years experience, 5 years in high-level programming languages (Fortran, Basic, and Boron, etc.), relational/normalized/normalized/other having database structure highly desirable. Database design work in a distributed systems environment a plus.

In addition to real opportunities for career growth and exciting technical challenges, we offer competitive salaries and an excellent benefits program. Please send your resume with salary requirements to Kim Patterson, Liton Mellonics, P.O. Box 3407, Sunnyvale, CA 94088-9407. U.S. citizenship required for most positions. **Mellonics is an equal opportunity employer.**



Liton **Mellonics**
Systems Development

MIS DIRECTOR

Section based div. of interest, comprehensive skills, accomplished mgr. for multi-site, 30+ staff, directorship. Proficient in mainframe, mini, and micro. Experience in blue chip co. & extensive sys. dev'l. utilizing structured design. The job is to manage the MIS division in rapidly expanding corp. environ. Requires excellent education background. North America, located in San Jose, CA. Send resume to 8704.

INTERSTATE BANK/
1900 Summer Street
Santa Clara, CA 95051
(408) 243-1340
Personnel Committee

Data Systems Modernization

The upgrade of the Satellite Control Facility involves Data Systems Modernization (DSM) which involves the DSD-7000 System Engineering, a project that requires the expertise of quality professionals. You must be a graduate of an ABET accredited college and have 5 years experience in systems development and application programming with real-time communication systems.

Senior Systems Analyst

To be Leader in systems development to support software design, software development, production and software management. Responsible for the software functions of a real-time interactive command and control system, to include translation, integration, and requirement analysis.

Responsibilities include the investigation and analysis of system requirements; design and development for development and design of software; making modifications for implementation and integration; the validation of software support requirements for space systems; the development of software, system integration, and support. You will also be responsible for support for system operation, support, testing, and will support test and validation and hardware interface analysis.

Requires BS in Computer Science, Math or Physics; 12-16 years experience and administration; software support; and knowledge of AFSC/DM operations.

Systems Analyst

A Team Leader responsible for real-time systems definition and design for Command and Telemetry. Perform detailed technical analysis addressing both the system requirements support, Requirements for software, architecture, system design, and system implementation. You will be involved in software requirements definitions, software design documentation, software development planning, engineering change processes, and design reviews and reviews.

The position requires a BS in Computer Science, Math or Physics; 8 years experience in operations research, studies and requirements; and knowledge of AFSC/DM operations.

SYSTEMS PROGRAMMER/ ANALYST

Programmer required for a DSD-7000 System Engineering, a project that requires the expertise of quality professionals. You must be a graduate of an ABET accredited college and have 5 years experience in systems development and application programming with real-time communication systems.

Requires degree and real experience to:

INTERSTATE PERSONNEL SERVICES, C/O HALL-CH

Princeton University

Princeton, New Jersey 08544

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System Security Professional

A promotion has created an opportunity in our System Security group for a data processing professional with a working knowledge of the ACF-2 Security System.

We are a progressive system security group responsible for all security components of a large multi-site CPU based data processing facility. As a member of our system security group you will utilize the latest technological tools and techniques in this challenging environment.

Primary responsibilities will include:

- Administration of corporate data and physical security policies/procedures.
- Technical administration of corporate data security procedures and techniques in support of IBM, VM/CMS, CICS, IMS.
- Implementation, maintenance and testing of the corporate disaster recovery program.

Primary experience should include: ACF2 Data Security, OS/360, and OS UNIX; TSO/SPF, and RSCOE, IBM PCs, MAD Mainframe, RDRP, RUSCO Access System, and Telecommunications.

Mail resume and salary requirements to the Employee Relations Department, or call 214-754-1171. Principals only please.



Central and South West Corporation

PO Box 600704 • Date: Issue: 7/24/85-014

Central and South West Corporation is one of the nation's leading energy companies, having revenues in excess of more than \$3 billion. With corporate headquarters in Dallas, CSWP serves more than four million people through its operating companies in Texas, Oklahoma, Arkansas and Louisiana.

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Selective interviewing at ROMAC® means we send you only fully qualified professionals, not an army of names to wade through. Our clients expect this service; our applicants demand this confidentiality. It is an important ROMAC® Difference and why in Banking, Data Processing, Accounting and Finance the ROMAC® Difference really is better.

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POSITION ANNOUNCEMENTS

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ANALYST/PROGRAMMER
1-800-753-3894 x 200
3 or more years experience in Data Processing & Systems. IBM 3270 DB2 experience a plus. Those are challenging positions with excellent compensation & benefits including medical, dental, life, disability, 401K, profit sharing, 10% bonus, 24 days vacation, 10% 401K, 10% 403B, 10% 457, 10% 457B, 10% 457C, 10% 457D, 10% 457E, 10% 457F, 10% 457G, 10% 457H, 10% 457I, 10% 457J, 10% 457K, 10% 457L, 10% 457M, 10% 457N, 10% 457O, 10% 457P, 10% 457Q, 10% 457R, 10% 457S, 10% 457T, 10% 457U, 10% 457V, 10% 457W, 10% 457X, 10% 457Y, 10% 457Z, 10% 457AA, 10% 457AB, 10% 457AC, 10% 457AD, 10% 457AE, 10% 457AF, 10% 457AG, 10% 457AH, 10% 457AI, 10% 457AJ, 10% 457AK, 10% 457AL, 10% 457AM, 10% 457AN, 10% 457AO, 10% 457AP, 10% 457AQ, 10% 457AR, 10% 457AS, 10% 457AT, 10% 457AU, 10% 457AV, 10% 457AW, 10% 457AX, 10% 457AY, 10% 457AZ, 10% 457BA, 10% 457CA, 10% 457DA, 10% 457FA, 10% 457GA, 10% 457HA, 10% 457IA, 10% 457JA, 10% 457KA, 10% 457LA, 10% 457MA, 10% 457NA, 10% 457OA, 10% 457PA, 10% 457QA, 10% 457RA, 10% 457SA, 10% 457TA, 10% 457UA, 10% 457VA, 10% 457WA, 10% 457XA, 10% 457YA, 10% 457ZA, 10% 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